ENGINEERING
LIBRARY

APR 27 1950

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

SPRING CONSTRUCTION—
RURAL ISSUE

APRIL 22, 1950
Vol. 138 — No. 16

Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION, 608 So. Dearborn St., Chicago 5, Ill. Subscription $3.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of March 3, 1879.

ANOTHER STROMBERG-CARLSON CONTRIBUTION TO BETTER

Dial Service!

The "No

MOUNTS EITHER HORIZONTALLY OR VERTICALLY

For horizontal mounting, set "2" opposite the flange; for vertical mounting, line up "9" with the flange.

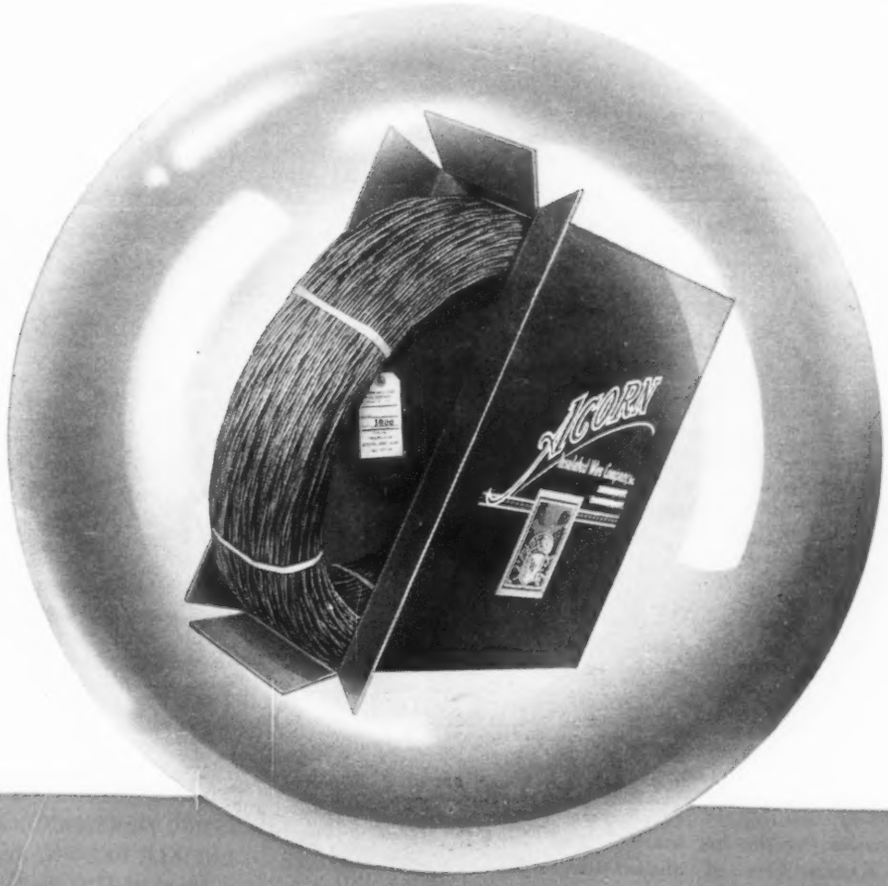
STROMBERG-CARLSON

Factory, General Offices: Rochester 3, N. Y.
Branch Offices: Atlanta 3, Chicago 6, Kansas City 8, San Francisco 3. In Canada: Stromberg-Carlson Co. Ltd., Toronto

TELEPHONES, SWITCHBOARDS

APR

ACORN INSULATED WIRE



FOR SUPERIOR PERFORMANCE — NEOPRENE

Acorn, manufacturers of quality wire for 34 years, offers NEOPRENE long life drop wire in its line of established dependability.

- ★ Drop Wire
- ★ Ground
- ★ Fixture
- ★ Cable Terminal
- ★ Switchboard
- ★ Instrument
- ★ Bridle
- ★ Interior
- ★ Jumper
- ★ Tree
- ★ Buried Wire
- ★ Pothead

ACORN INSULATED WIRE COMPANY, INC.

MAIN OFFICE, FACTORY AND WAREHOUSE: 36 FREEMAN STREET
PAWTUCKET, RHODE ISLAND

Additional Warehouse Facilities:
New York • Chicago • Cleveland • San Francisco • Los Angeles • Portland • Seattle

FLASHES AND PLUGS

MANEUVERS MISTAKEN. Scared San Franciscans got an idea of aerial warfare recently when the 61st fighter wing of the California National Guard decided to stage an emergency air alert. The purpose was to intercept two "enemy" C-47 transport planes, manned by men of the 61st.

Dutifully, the "enemy" was picked up on the radar screen, and the whole unit snapped into action. Nine hundred officers and men, pilots and ground crewmen, raced away from their jobs in San Francisco and East Bay. The 61st's switchboard operators started ordering the telephone company to "clear the lines."

Within minutes, a dozen interceptor pilots in P-51 fighters were aloft to "shoot" the enemy down. A spectacular "dog fight" ensued over Golden Gate park.

Meanwhile, consternation reigned below. The telephone company couldn't get information from either National Guard headquarters in Sacramento or the fourth air force.

Jet fighters with loaded guns were made ready. Army, navy and marines were alerted, too. And telephone lines into the mayor's office were humming.

Finally, the ground command, sensing that people were getting disturbed, called a halt.

• • •

MUSIC BY TELEPHONE. Icy streets prevented the Youth Fellowship group of the Lakeview Methodist Church in Chicago from making a motor tour of invalid members' homes to sing hymns on Easter Sunday. However, the shut-ins were not deprived of music, as they heard the hymns and an Easter poem by telephone.

• • •

WHAT WOULD THE YANKEES DO? The *Denver Post* was swamped with telephone calls one day recently from baseball fans who feared the great Joe DiMaggio had been gunned down by mobsters.

The *Post* telephone switchboard operator—a fan herself—was both frightened and bewildered. She said as far as she knew "the DiMag" was in St. Petersburg, Fla., with nothing more serious than a pulled calf muscle.

It developed the reason for the big scare in the baseball world was the slaying in Kansas City of underworld figure Charles Binaggio.

• • •

A STUDY IN CONTRASTS. Japan ranks 30th in the world in the number of telephone owners. There are 1,200,000 instruments in the country or one and one-half telephones for every 100 persons, according to a survey conducted by the Economic Stabilization Board. The board noted that this contrasted with an estimated 60 million telephones in the United States.

The statistics were compiled in connection with a long-range proposal to transfer the Japanese telephone system—a government monopoly—to private ownership.

• • •

JUST TO MAKE SURE. A San Francisco woman believes in being prepared. She made a 2,100 mile long distance telephone call to a taxicab company in St. Louis, Mo., to arrange for a cab to meet her air liner when it landed there.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

April 22, 1950

Contents

RURAL TELEPHONE LOAN PROGRAM 17
By Claude R. Wickard

RURAL LINE CONSTRUCTION 19
By Daniel Seitz

IN THE NATION'S CAPITAL 23
By Francis X. Welch

REA ANNOUNCES FOURTH LOAN ALLOCATION TO VIRGINIA COMPANY 24

ENGINEERING TRENDS IN RURAL CONSTRUCTION 25
By Ray Blain

PROTECTION FOR EXCHANGE TELEPHONE CIRCUITS 29
By M. F. Noster

TELEPHONY'S SAFETY BULLETIN—No. 18 32
By Frank E. Lee

IOWANS' SMALL COMPANY PLAN IN HIGH GEAR 38
By R. C. Reno

PLANT MAN'S NOTEBOOK 46
By Ray Blain

PRACTICAL SUGGESTIONS FROM THE FIELD ... 50

ILLINOIS CONVENTION TRAFFIC CONFERENCE 55
By Mayme Workman

H. D. FARGO, Jr., *President & Advertising Manager*
R. C. RENO, *Vice-President & Editor*
H. D. FARGO, *Vice-President & Treasurer*
A. J. STULTS, *Secretary & Western Manager*
ETHEL HARTMAN, *Associate Editor*
LUCILLE BROWN, *Associate Editor*
RAY BLAIN, *Technical Editor*
FRANCIS X. WELCH, *Washington Editor*
MAYME WORKMAN, *Traffic Editor*
VIVIAN RYDEN, *Circulation Manager*

Published by
TELEPHONY PUBLISHING CORP.

Vol. 138, No. 16. Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION, 608 South Dearborn St., Chicago (5), Ill. 15 cents per copy (except special issues). Subscription $3.00 per year U. S. and Countries in U. S. Spanish Postal Zone; $4 Canada; $5 Other Countries. Entered as second class matter at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

Telephone WA bash 2-2435
608 S. Dearborn St., Chicago (5), Ill.
U. S. A.

RURAL TELEPHONE LOAN PROGRAM

By CLAUDE R. WICKARD
Administrator, REA

REA is now in the business of financing rural telephone service. Leaders of the telephone industry have expressed the view that whether they approve or disapprove of this development, it is now the law and that, therefore, they will submerge their past personal feelings in an honest effort to make the new program successful.

We in REA know that this attitude will continue to be helpful to us in the future as it has in the past three months. For among my first callers after the telephone program was approved, were top representatives of the Bell System and of the United States Independent Telephone Association, and we had long talks from which we at REA gained a great deal of helpful information.

No program requiring cooperation can be very successful unless there is a full understanding of the facts and ideas on the part of all. For that reason especially, I welcome this opportunity to use this magazine to reach industry leaders.

The action of Congress, in amending the basic Rural Electrification Act of 1936 by adding a new title covering loans for rural telephone service, is both a compliment and a challenge. Congress' action recognizes the effectiveness of the REA pattern during the last 15 years in the field of rural electrification. At the same time, by applying the pattern to a new task, Congress is putting it to a test that promises to be as difficult as any so far encountered.

Let me start by stating that we know that rural telephone service and its problems are considerably different from rural electrification and its problems. Telephone leaders have told us and the Congress that this is so, and our initial studies confirm it. Consequently, we are going into the new program with open minds, determined to develop the best approaches possible in carrying out the purposes of the telephone legislation.

To get a better picture of the rural telephone loan program, let us take a look at what goes to make up the REA pattern. Basically five elements are involved:

(1) There must be a need.
(2) Filling that need must promote the general welfare.
(3) The action program must involve loans, not grants nor govment operation.
(4) The benefits of the government aid must be made available widely on an area coverage basis instead of to only the more lucrative sections.
(5) Filling the need must be accomplished within the framework of free enterprise and democracy.

It is evident that the Congress wishes the rural telephone program to fit that pattern.

On the first point, the existence of a need, there was substantial disagreement during the discussion that preceded enactment of the new law. Of

CLAUDE R. WICKARD

the fact that, more than half of the nation's farms do not have telephones, or that perhaps half of the present farm telephones give unsatisfactory service, there was little dispute. In this respect we are no better off now than in 1920, a situation incidentally which most people, including farmers, find it difficult to understand.

The main difference of opinion was on the willingness and ability of the telephone industry to effect an improvement. In the final analysis, the fact that there are relatively few farms with telephones after several decades of effort was eloquent on this point. Statistics of postwar improvement reveal that more suburban and fill-in operations were undertaken than striking out into typical farming sections, however.

On the second point, there was uniformity of agreement. The farmers certainly need modern telephone service, not only in their social contacts but also, more important, as a business aid and as an emergency safeguard. In addition, of course, expansion of rural service is of no little significance to the businessmen on Main Street as well as in the larger urban centers.

On the third point, that the program should be one of loans, there was universal agreement. There may have been some misunderstanding on this point, however, and I will return to it at some length later.

The same is true in regard to the necessity for area coverage. There was no disagreement in principle, but some misunderstanding and some doubt of the practicability of area coverage in the field of rural telephone service. More on this point later, also.

A great deal of discussion centered on point five, which specifies that the program operates within the framework of free enterprise and democracy. Those opposed to the legislation said it couldn't be done, and those in favor said it could be done. The discussion turned on two main questions. One was the extent to which borrowers would have a free hand in running their own businesses. The other was the question of whether or not the program would socialize the telephone business.

In regard to the first of these two questions I believe a fair examination of REA lending practice will reveal that REA asks no more of its borrowers than any prudent banking agency, public or private, does under similar circumstances.

As a possible comfort to those who may still have some worries on this score, let me state that one of the witnesses favoring the rural telephone legislation was a man who, as president of a small Illinois power company, had obtained an REA loan in the early days of our program. Apparently he had suffered no interference with running his business the way he wanted to run it, for he seemed anxious to borrow for the telephone system he now heads.

REA does, of course, have loan requirements that have to be met since the law specifies, first, that area coverage is to be promoted by the loan program and, second, that the loans must be self-liquidating. If these requirements were not part of the program, the borrowers obviously would have a much freer hand, but then the program's character would be changed to one of limited service and doubtful security which, as far as I know, no one has proposed.

A great deal of the opposition to the telephone legislation was based on the fear that it would somehow involve Socialism. I do not see how this is possible. In the first place, the telephone law does not authorize REA to go into the telephone business, but to make loans to private "persons" or organizations so that they can expand and improve rural service. Consequently, instead of putting the government in business—which is my understanding of what is meant by Socialism—the program in fact does just the opposite by strengthening the hand of free enterprise.

Against that background discussion of the REA pattern, let's look at the provisions of the law, and then at the REA policies as we have endeavored to establish them.

The law provides that REA may make loans to improve or extend rural telephone service. The loans bear 2 per cent interest and must be repaid over a maximum of 35 years. Any unit qualified under state laws to operate a telephone system, except a public body, is eligible to borrow. Existing companies—commercial or non-profit—and new non-profit groups have preference, and during the first year an application from an existing company must be acted upon before an application from anyone else to extend service to substantially the same subscribers can be approved.

Loans may be used to improve or extend rural service. Up to 40 per cent of any loan may be used for refinancing, if the result of the refinancing would be rural service improvement or extension. We can make loans to finance acquisition by one company of the properties of another, if necessary to provide more or better rural service. While we cannot finance consolidations as such, the resultant company would be eligible to borrow to improve or extend the consolidated system.

If any approval from a state regulatory agency is necessary, it must be obtained before we can approve a loan. If not, I must have information from which I can certify that no duplication of facilities providing reasonably adequate service will result.

Loans can be made to extend or improve service to people in rural areas. "Rural areas" are defined within the law as areas "not included within the boundaries of any incorporated or unincorporated city, village, or borough having a population in excess of 1,500 inhabitants." The financing of facilities in a town larger than 1,500 can be undertaken by REA only if it is necessary to provide better rural service.

The law covers a lot of subjects, but it is not long nor complicated. We would be glad to send a copy of the law, as well as a booklet with a non-technical explanation of it quoting from the conference committee report, to anyone who asks for it.

One of the most important provisions of the law directs the administrator to make loans in such a way as "to assure the availability of adequate telephone service to the widest practicable number of rural users of such service." This brings up the question of what we mean by area coverage, and what the law demands.

The intention of Congress in this regard is abundantly clear. In its unanimous report favoring adoption of the telephone loan program, the Committee on Agriculture of the House of Representatives said:

"The key to adequate rural telephone service is area coverage. This means planning, financing, and constructing a rural telephone system so that service will be available to all the subscribers within the company's area who want it, whether the installation and operation of their particular telephone will be profitable or not. In other words, it means planning and building the entire area system as a unit rather than following the prevailing practice of telephone companies of building lines where business is most profitable, establishing a rate structure on that profitable business, and then either refusing to extend lines into unprofitable areas or requiring the consumer to bear the expense of such lines."

A city telephone system may have many individual telephones which do not pay their own way. Yet under the franchise provisions, and as a matter of public protection, the universal policy in urban areas is area coverage. We think people in rural areas are entitled to the same treatment.

Telephone loan applicants must give evidence that they can and will make telephone service available to everyone in their service area. If the initial loan does not provide service or definite plans for service for the entire area, it must cover at least a proportionate share of the less profitable territory.

An essential part of area coverage plan is providing service at uniform rates to each subscriber in each class of subscribers regardless of the location of the subscriber in the service area.

The first-class mail service provides a ready illustration. Anybody in the United States can send a letter to anybody else here, no matter how far away, for three cents. Obviously some letters cost more than three cents to handle. But some of them cost less than that, so the government shows an over-all profit on this class of service. The profit from handling a letter going just a few miles is used to meet the slight loss in sending one a couple of thousand miles.

We do not believe that this area coverage requirement is going to be as difficult to meet as some of the doubters would imply. We could not, and would not if we could, require a company to borrow money for an undertaking which would make its business a losing one. I must certify, on approving a loan, that it will be paid back during the term specified. The only place we can look for repayment is to the net revenues of the borrower.

In any event, please bear in mind that the area coverage requirement is not an administrative ruling, which we might change or relax in a specific case. On the contrary, it is written into the basic law under which we operate. I have no power—and I might add no will—to do anything about it except obey it.

The Congress' forthright statement of policy does seem to make clear that first and foremost the program was set up for the benefit of rural people in need of adequate communication. That the program will be of help to a great many rural telephone businesses—while this is not the primary purpose of the legislation—is nevertheless an important factor in the national business economy.

We will not make 100 per cent loans, as we do in electrification. The borrower will be required to furnish some of the capital because of the greater risk involved.

There are several reasons for this. An important reason is the fact a power consumer once getting service is likely to keep right on taking it despite the ups and downs of the business cycle.

When a farmer gets power, he not only invests several hundred dollars in wiring and appliances which are useless to him if he lets his power be disconnected, but frequently he changes

(Please turn to page 52)

RURAL LINE CONSTRUCTION

By DANIEL SEITZ
Cable Superintendent
York (Pa.) Telephone & Telegraph Co.

THE very small rural plant owner-manager must be extremely versatile. In addition to being manager, he must also be a clever financier, a smart switchboard repairman and, at times, a good lineman and a better trouble shooter. He may even be forced to pinch-hit as a part-time switchboard operator.

As a financier, he must make certain that equipment and supplies he buys are the best obtainable, although they may not be the cheapest for each job. For example, with the outside plant being exposed to the elements, special care is required in selecting the proper poles, wires, etc., in order to provide a good and lasting job.

Considerable savings can be made by the use of high strength steel wire for open wire circuits. For example, 40 poles per mile will be required for 130-ft. spacing, whereas only 21 poles per mile are necessary for 250-ft. spacing. High tensile strength wire is available in several gauges, i.e., No. 12 BWG .109 diameter wire with a minimum breaking strength of 793 pounds and 34.12 ohms resistance per mile for span lengths as follows:

Heavy loading areas 225 ft. spacing —24 poles per mile.

Medium loading areas 350 ft. spacing—15 poles per mile.

Light loading areas 375 ft. spacing —14 poles per mile.

In addition, there is the extra high tensile No. 12 BWG .109 diameter line wire, same gauge as above, except that it has a minimum breaking strength of 1,213 pounds and 38.23 ohms resistance per mile. This type of wire is intended for spans 350 ft. long in heavily loaded areas — 15 poles per mile; 450 ft. in medium loading—12 poles per mile, and 500 ft. in light loading districts — 11 poles per mile. The span length as recommended by any manufacturer of high tensile strength wire should never be exceeded.

Joint use of pole lines by power and telephone companies will, in many cases, prove economical and desirable providing good construction practices are observed. Good clearance between power and telephone wires on jointly used poles is most important. *Fig. 1* shows a good example of joint construction. This line has good corner poles, well guyed. The wire is sagged properly and is attached to the insulators properly. The splices are made with compression type sleeves after the wire has been thoroughly cleared. This type of line insures good service

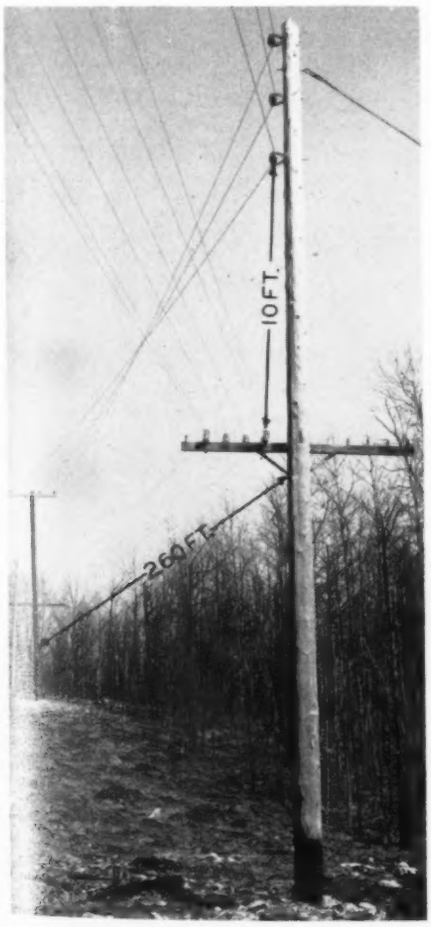


Fig. 1. A good example of joint power and telephone construction.

Fig. 2. Improperly constructed and maintained rural lines are certain to cause trouble.

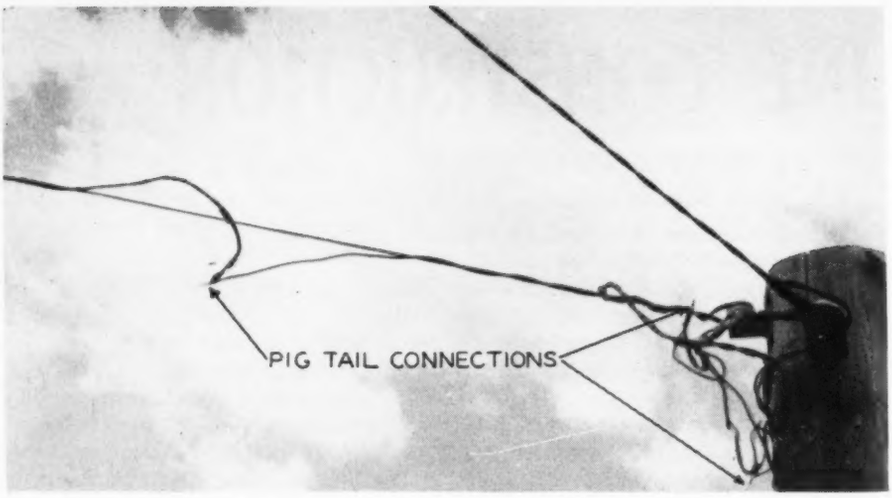


Fig. 3. The type of temporary job that usually becomes permanent.

for the subscriber, long life and a profitable investment for the owner.

One of the most important considerations in the use of galvanized iron or steel wire is the avoidance of making twisted hand joints. Even though a strong hand connection has been made, it is likely to develop high resistance because of the cracking of the galvanizer which immediately starts rusting action.

Fig. 2 shows a rural line where service interruptions are frequent. These are due to slack wire which shorts and crosses during wind storms. The iron wire is also rusty and many of the hand joints are certain to form faults, together with the condition of the poles, contribute to poor service.

Temporary repairs of open wire or subscriber's loops should be avoided in all but emergency cases, since temporary repair invariably becomes "permanent." One wire of the pair in *Fig. 3* carries all of the strain and will eventually break. It would have taken only a short time longer to have made a permanent job. This could have been accomplished by dropping the loop to the ground and splicing on a short length of wire by the use of compression sleeves. The pig tail connections also are sure to eventually cause poor high resistance connections. These transmission or noise on this subscriber's station.

In the past, much of the early wire replacement on open iron wire circuits was caused by hand made joints. This is also true of hand made joints in copper line wire except that the joint does not rust. It does, however, corrode and eventually becomes a high resistance connection also. Now that we have compression type sleeves for both iron or copper wire, we should be certain to use only sleeves of material similar to that of the line wire. For example, never use copper sleeves on galvanized iron or steel and likewise do not use galvanized iron or steel sleeves on copper wire. The same precautions should be observed when test connectors are used. A brass or copper connector should never be used for connecting galvanized iron to galvanized iron. Use, instead, a galvanized connector.

When connecting copper drop wire to a galvanized iron line wire, a connector as shown in *Fig. 4A* is recommended. This connector has a galvanized body with a brass lug, nut and washers. When the copper drop wire is connected to a copper line wire, a connector *(Fig. 4B)* which is made entirely of brass or copper should be used.

Regardless of how well we plan and

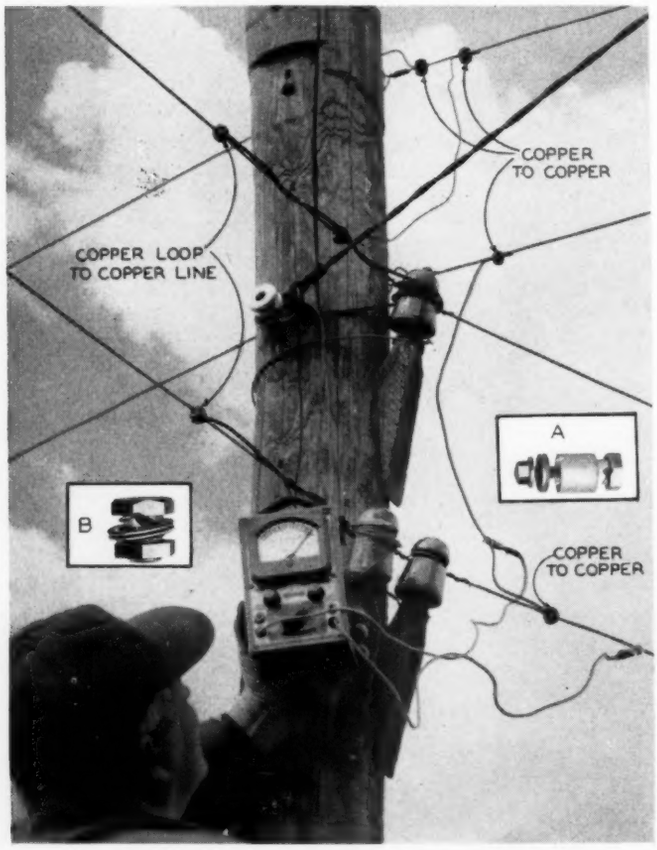


Fig. 4. The ohmmeter used for testing connectors on junction pole.

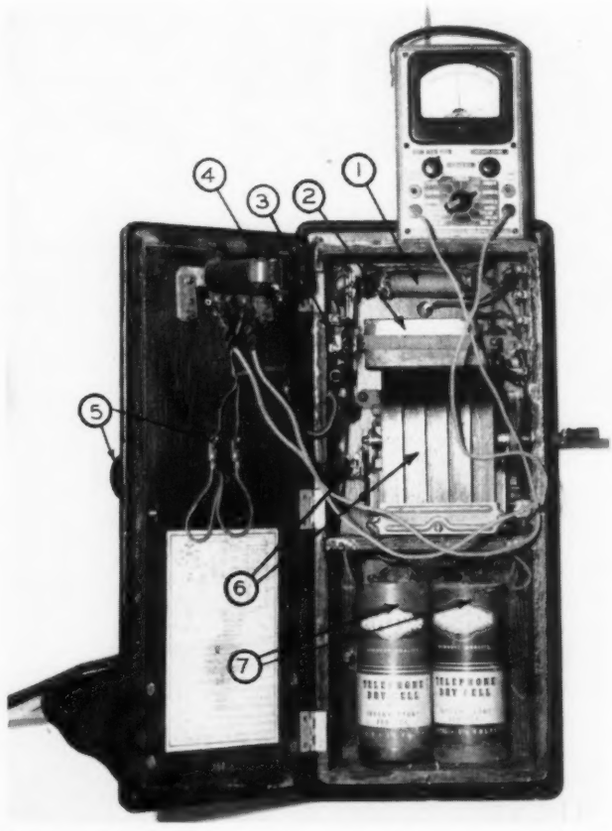


Fig. 5. The ohmmeter used for testing separate units of magneto telephone.

build the line, subsequent troubles are sure to develop and we should be prepared with the essential test instruments for locating faults on the line, instrument or switchboard, both economically and expeditiously. This does not necessarily mean that complicated and expensive equipment is necessary in a plant where the system is magneto with little or no cable and a simple ringdown type of switchboard. Practically any case of trouble on a magneto system, including switchboard line and station equipment, may be tested and cleared by the use of a good magneto test set and an ohmmeter. Loose, dirty or corroded test connectors are frequent causes of noisy circuits, poor transmission, etc. An ohmmeter is ideal for testing the quality of the connection being made by the test connector.

A telephone receiver may be substituted for the ohmmeter by connecting one clip of the receiver cord on each side of the test connector, as when using an ohmmeter and listening for noise. If noise is not heard, it may be assumed that the connection is good. *Fig. 4* also shows an ohmmeter being used for detecting high resistance joints between two copper line wires coupled by a test connector. In this case, the meter indicates a zero resistance, therefore, the connection is good. If the ohmmeter indicates any resistance when attached, as shown, the connector should be removed and replaced or at least thoroughly cleaned and taped. The line wire should also be

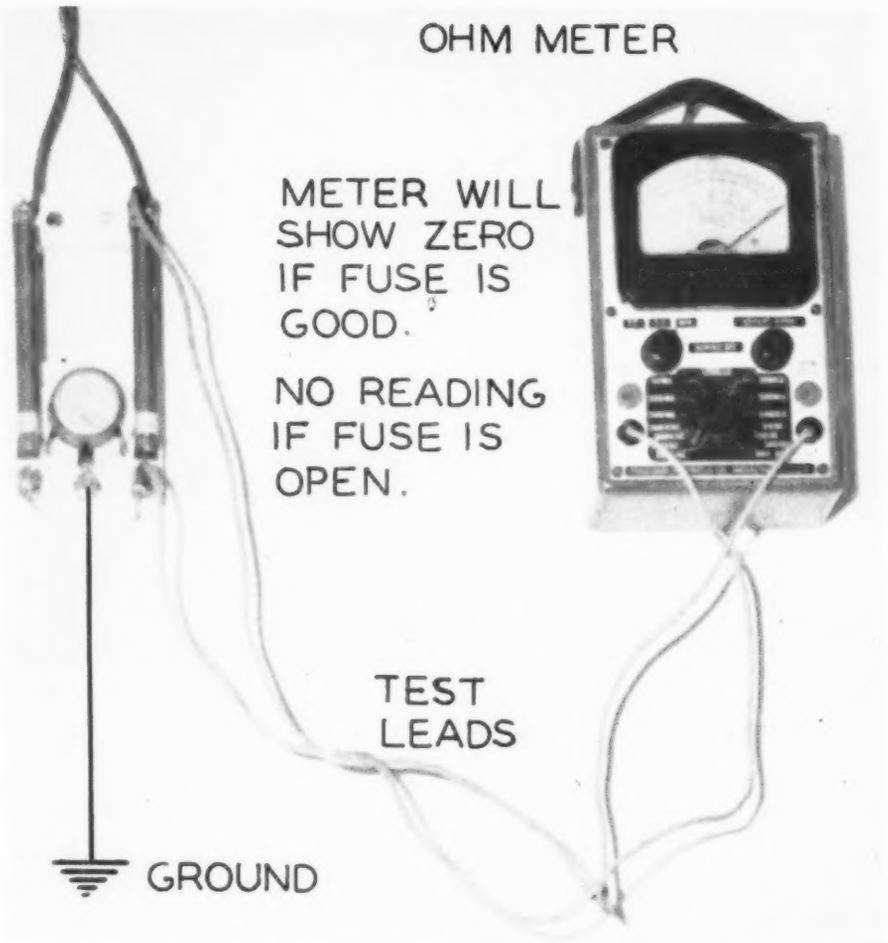


Fig. 6. Ohmmeter used for testing fuses.

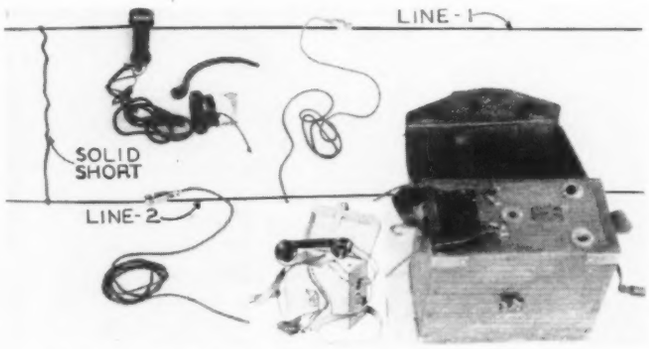


Fig. 7. Test sets used for locating trouble without opening lines.

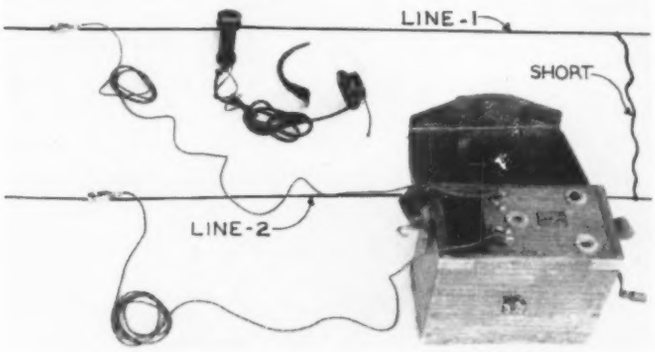


Fig. 8. Testing for location of low resistance short trouble.

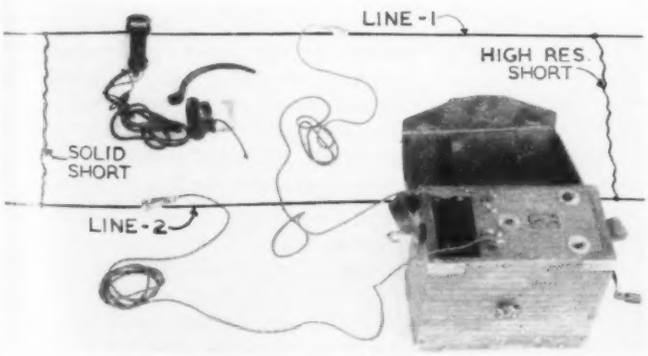


Fig. 9. High and low resistance trouble location tests.

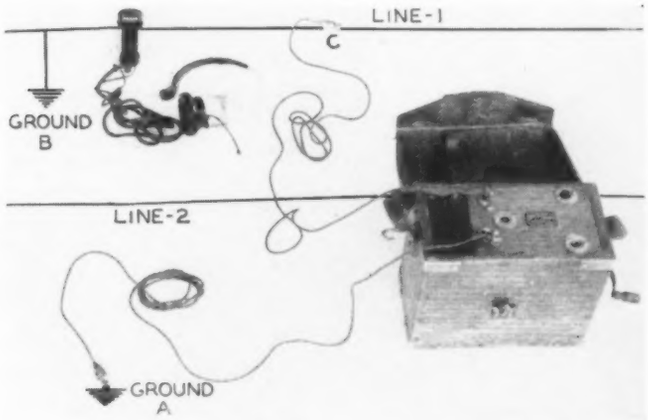


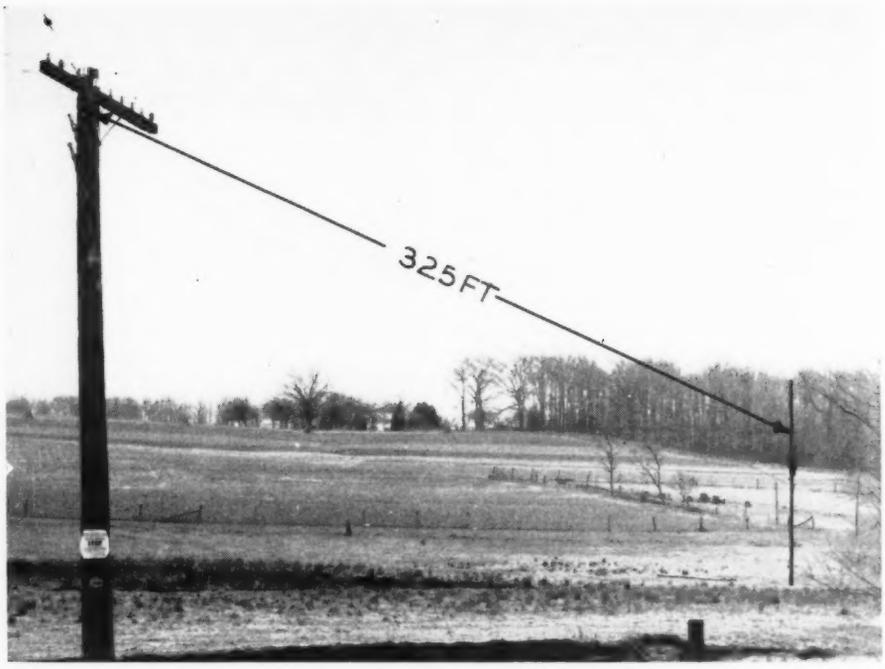
Fig. 10. Test to indicate direction of ground trouble.

cleaned before replacing the test connector.

Where it is desirable, because of the length of branch lines, etc., to use test connectors, as shown in *Fig. 4*, an ohmmeter is very useful for checking each branch for detection of abnormal conditions. It is a good idea to measure the resistance of each branch when the line is in satisfactory working condition, making note of the resistance readings, then when faults occur later, the difference in readings will indicate the fault location.

In addition, measuring the resistance of each line to shorts and grounds from the central office to reference points and recording these readings will provide useful information when a real fault develops on a circuit.

The ohmmeter is also extremely useful for making numerous tests in the central office. Tests such as measuring the resistance and checking for opens, grounds to the core of drop coils, operator's transmitter receiver, etc., may be satisfactorily conducted with this instrument. By connecting one cord of the meter to the sleeve of the answering plug and the other to the sleeve of the calling plug of the same pair of cords, the contacts in the listening key may be tested for opens or faulty contacts. The tip-to-tip connection may be tested in a like manner. Moving the listening key slightly will indicate cut-out trouble. The ringing machine or hand generator output may also be measured with the multimeter, shown in *Figs. 4* and *5*, as this is a combination alternating current voltmeter, a direct current voltmeter, as well as an ohmmeter.



Long span branch line on private right-of-way.

Fig. 5 shows the many tests that may be made with the multimeter. All values given below apply only to the Western Electric instrument pictured. Similar instruments are produced by most manufacturers of testing apparatus.

(1) The induction coil primary winding 1.4 ohms; secondary winding 17.0 ohms (ohmmeter).

(2) Condenser will test open when in good condition (ohmmeter).

(3) Receiver resistance 84 ohms (ohmmeter).

(4) Ringer resistance 1,250 ohms each coil — total 2,500 ohms (ohmmeter).

(5) The transmitter may be tested by connecting the ohmmeter to the transmitter cord terminals and then talking into the transmitter. If it is in good condition, the pointer will swing back and forth as the volume of sound is raised or lowered (ohmmeter).

(6) Generator shunt, connect meter to shunt terminals with instrument wiring disconnected. To be trouble-free, it should show open. Any reading means a partial or solid short (ohmmeter). To check the generator output, connect the meter to the line terminals of the instrument and turn generator at a moderate speed. If good, it will produce approximately 80 volts ac current at 1,025 rpm (alternating current voltmeter). A three magnet type generator, same manufacture, will have a 60-volt output.

(7) For battery, read amperes of each individual cell (ammeter).

Fig. 7 shows the ohmmeter being used for checking fuses. The ground wire from the station protector to the ground connection should be run as directly as possible without bends or turns. Never connect the station protector ground wire to isolated water systems to which power wiring is also connected. Keep telephone and power grounds well separated. The ohmmeter may also be used for testing protector discharge blocks by connecting one test lead to the ground terminal and the other, first to one side of the line, then the other. If the meter reads zero when connected to either line terminal then that side is grounded.

The test shown in *Fig. 7* will indicate the direction of trouble. By connecting the line cords of the test set as shown, the turning of the generator will produce a tone in the direction of the short. A tone will also

(Please turn to page 58)

Long span two-wire branch line construction with metallic bracket supports on corners.

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH
WASHINGTON EDITOR

REA pinning hopes of getting full rural telephone loan appropriation on Senate. . . . Congressmen showing belated interest in government economy. . . . Education of shut-in children spreading in east.

REA Still Hopeful for More Funds

THE House of Representatives this week tackled the controversial "Omnibus" appropriations bill. This $29 billion measure includes appropriations for REA loans for operating expenses in both the rural telephone and rural electrification fields.

Washington observers do not expect that any successful effort will be made on the floor of the House to restore budget items cut down by the House Appropriations Committee. This would include the 50 per cent cut made in President Truman's request for REA rural telephone loans between July 1, 1950, and July 1, 1951 (originally $50,000,000 cut down to $25,000,000). It would also include the cut in REA administrative funds, earmarked for rural telephone work (originally $2,100,000 marked down to $900,000).

But REA, as well as other federal agencies, which have felt the bite of the House Appropriations Committee's ax, is now pinning its hopes on the Senate. The White House contact with the Senate Appropriations Committee is in better working order than has been the case with the House Appropriations Committee. The explanation lies in the strong economic wind blowing during an election year.

All representatives in Congress must stand for reelection in November if they expect to continue in Congress. Comparatively few of them will care to risk sticking their necks out for any proposition which would place them on record in favor of further unbalancing the budget. It is safer for them to stand by the fairly modest cuts which the House committee made in the budget.

Over in the Senate, a different situation prevails. Two-thirds of the senators do not have to face elections this year. They are in a position to trade favors with agencies seeking higher funds. Of course, the "economy bloc" is somewhat stronger than it used to be even in the Senate. It has a rather zealous recruit in the person of Senator Douglas (D., Ill.), who has served notice of a bitter fight on any attempt to restore appropriations which the House has voted out of the Omnibus Bill. But the REA rural telephone item is so small, and REA appropriations have been so politically popular in the past, that there is a fair chance the senators will try to get more money for the rural telephone program.

Last week, REA made only one new rural telephone loan—a rather small one; $55,000 for a telephone company in Chancellor, Va. But it would not take a great number of small loans, spread over the entire period of a year, to exhaust a fund of $25,000,000 proposed in the House bill.

Economic Storm Warnings?

In showing a modest and somewhat belated interest in economy for federal spending and lending, the congressmen may be responding to a number of economic storm warnings which well-qualified experts have been sending up. One of the most persuasive comes from President Truman's recent economic adviser, Edwin G. Nourse.

Dr. Nourse, it will be recalled, resigned as chairman of the Council of Economic Advisers, following differences of opinion over deficit financing and other basic fiscal policy. Nourse claims the United States is now "indulging in an Indian Summer daydream" while a business storm is brewing.

Each segment of the economy, Dr. Nourse added, must put the country's welfare "above short-run gains for its particular constituents" if we are to avoid a depression. He voiced this conviction in a recent speech in Philadelphia before a panel discussion arranged by the American Society of Tool Engineers.

In Washington, however, a Federal Reserve Board report found that, while Americans appear somewhat bothered by economic prospects, they nevertheless seem bent on boom-level buying—something that should help business stay good.

Furthermore, the board said, people have less hope of general price cuts this year than last, although more than half figure that prices of cars and major household items will come down.

A board of survey of consumer buying plans pointed to continued record sales of home and autos this year, more than doubled sales of television sets and a strong market for furniture, refrigerators, and other goods.

Dr. Nourse observed that "five years of almost intoxicating prosperity" have melted away the expected postwar slump. Business, financial, agricultural, and labor leaders, the economist said, "are being encouraged to feel they can use organization and political power to get separately more out of the system than they are severally putting into it."

The reserve board survey, besides checking on consumer buying plans, sought to find how people felt about a good many things. Here are some of the results, as announced by the board:

More think their incomes will rise this year than think they will fall.

There is greater uncertainty about the business future than there was a year ago. While there is "less optimism," there also is "somewhat less outright pessimism."

Nearly half consider times are good now. But a still larger proportion was willing to say that a year ago. High income groups feel better about 1950 than the lower income groups.

So far as workers are concerned, more than half think it would be "difficult, if not impossible, to get another job paying about the same amount of money if they were to lose their jobs."

Habitual Error in Government Cost Estimates

Whenever private company management grows impatient with the margin of error required by employers and others whose duty it is to estimate construction costs, a comparative glance

at the experience of federal government cost estimation is in order. With federal agencies, underestimation of construction cost has long been traditional. But the wild degree of variation is even challenging the attention of Congress—at long last.

Last week, the Council of State Chambers of Commerce released a study by its research director, Alvin A. Burger, covering government projects in 17 states. It shows that original cost estimates invariably go up as the projects near completion. The main targets of the Burger study were the Bureau of Reclamation and the army engineers.

The study concluded: "It would seem that this propensity for grossly underestimating public works costs at the time such projects are up for congressional approval is chronic. More suspicious souls might conclude that the Corps of Engineers and the Bureau of Reclamation deliberately underestimate costs of proposed new projects as a 'come-on' to win such approval."

The study found the original estimates for 31 public works projects under Bureau of Reclamation sponsorship totaled $1,682,488,174. But subsequent estimates reveal these projects will cost $5,252,404,105, an increase of $3,569,915,931, an increase of 212 per cent.

Of 183 Corps of Engineers projects whose original estimates aggregated $3,295,307,750, the council revealed that new estimates indicate their cost at completion will be $5,726,808,070, an increase of 74 per cent.

During the next few weeks a long parade of spenders will converge on Capitol Hill in Washington to urge Congress to approve increased expenditures for what are commonly known as "pork barrel" projects.

The term "pork barrel" has long been applied to federally financed public works construction designed primarily to benefit specific localities or regions. They include river and harbor improvements, flood control, irrigation, and water supply projects, and electric power plants and facilities. The bulk of such construction is done by two federal agencies—the Corps of Engineers of the U. S. Army, and the Interior Department's Bureau of Reclamation.

It must be said that many of these public works projects have proved both necessary and sound. On the other hand, many others have fallen short—some far short—of being economically justified. Efforts to set up machinery for appraising the economic soundness of public works projects in advance of their authorization by Congress have had small success. Such machinery stands up poorly against congressional "pork barrel" log-rolling, implemented by pressures from government lobbies, organized contractors and self-seeking local interests.

REA Announces Fourth Loan Allocation to Virginia Company

The U. S. Department of Agriculture announced on Apr. 11 the fourth telephone loan allocation by the Rural Electrification Administration. The allocation of $55,000 was made to the Fredericksburg & Wilderness Telephone Co., Chancellor, Va.

The company, founded in 1908, now serves 170 rural subscribers in Spotsylvania County. It will use the loans funds to:

(1) Rehabilitate its present 40 miles of line.
(2) Construct 38 miles of new line, to serve an additional 130 subscribers, 40 of whom are now on its waiting list.
(3) Provide a new central exchange near Chancellor.
(4) Convert the present system from magneto to dial.

Free service, eliminating the present toll charge, will be provided between the company's present area and Fredericksburg, the principal trading center. Service will be available 24 hours a day, instead of 14 hours as at present.

This program will provide full coverage in the company's present franchise area. The company has expressed an interest in further extension of its service into an unserved rural area just south of its present territory, for which it does not now have a franchise. Permission of the Virginia Corporation Commission to serve this area will be sought if there is sufficient desire among the residents for service, according to REA.

The first loan, in the amount of $243,000, was made to the Florala (Ala.) Telephone Co. (TELEPHONY, Feb. 25, p. 17: Mar. 4, p. 13). The second loan, for $45,000, was approved for the New Lisbon (Ind.) Telephone Co. (TELEPHONY, Mar. 18, p. 21). The third loan allocation was made for the Patterson Telephone Co., Rotterdam Junction, N. Y., in the amount of $95,000 (TELEPHONY, Apr. 1, p. 18).

Shut-in Education by "Intercom"

Among recent suggestions for the improvement of educational opportunities in the United States, which find their way to the Office of the United States Commissioner of Education, is one that should be of special interest to telephone men. Most of us have read, from time to time, about specialized educational programs in such fields of higher learning as medical surgery and dentistry being conducted via long distance telephone. Learned societies have managed to meet for the exchange of ideas through the medium of "conference" calls.

But one of the really heartwarming applications of telephone techniques is its use in helping handicapped children and others, who may be "shut-ins" for some reason or other, to get the advantage of systematic education. The practical side to this idea is the possibility that "education by telephone" will give these deserving little people a better grade of education at even less expense and personal discomfort than some of the more elaborate special school programs which require traveling for teachers or handicapped students.

New Jersey is apparently the first eastern state to take up by individual communities a remarkable innovation from the middle west, whereby boy and girl shut-ins can get actual classroom instruction in their homes. The telephone industry name for this practice is "intercom" service. The New Jersey Bell Telephone Co. recently established a two-way telephone communication between home and classroom, so that the pupil can listen to and take part in recitations, and even interject questions if he desires.

The school board of Little Falls, N. J., was the first to apply this principle in the case of little Bobby Filipello, a third-grader confined to his home by asthma. Cost of installation is $15 and the monthly service is $11.85 plus federal tax. Reports of the success of the experiment and the higher standing achieved by young Bobby than when he was being taught two hours a day by a visiting teacher, at a cost of $100 per month were widespread. The Board of Education of Clifton, N. J., has decided to use the plan with a dozen cases of shut-ins. The Glen Ridge, N. J., board followed suit.

Aside from the economy effected by what the Bell company says is the first installation of the sort anywhere in the east, there is the psychological advantage for the little student who

(Please turn to page 71)

ENGINEERING TRENDS

In Rural Construction

By **RAY BLAIN**
TELEPHONY'S Technical Editor

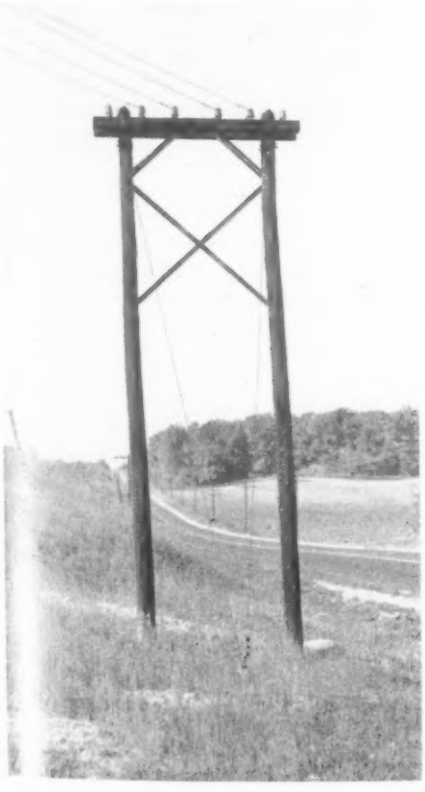
[**EDITOR'S NOTE:** *In this article, the author reviews the numerous attempts that have been made in the past to reduce the cost of rural line plant and provide better telephone service at lower costs. Advantages and disadvantages of certain types of construction are discussed. A number of suggestions are offered as to the possible use of carrier systems to provide good rural service at low cost.*]

* * *

THE problem of improving and increasing telephone service to rural areas is presently receiving serious and careful consideration by practically every operating telephone company. Because of improved transportation facilities and an urgent desire on the part of the average American for better living conditions, there is a definite trend in the movement of our population from the older sections of towns and cities to suburban areas. Many who were once satisfied with an apartment, or a 50-ft. front lawn, now consider five acres in the country a bit cramped. At the present time, it is not uncommon for people to commute 50 miles or more by train, bus, or car from their home to their job. This movement to outlying areas also has been accelerated during the past few years because of the publicized threats of atomic warfare.

In addition, there is a trend toward the decentralization of industry and the location of factories in small towns. In this connection, men who work on farms are available for employment in factories during slack periods on the farm. For these reasons, therefore, it is believed that there will be still a further demand for rural telephone service.

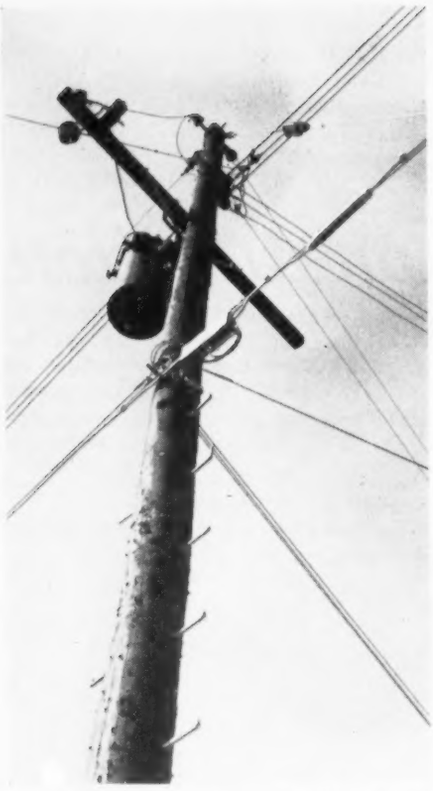
Such a radical change in the living habits of so many people has drastically increased the problems in connection with the provision of telephone service. The average American business man will not be content with inferior telephone service in his home even if he does happen to live in the country. The days are gone forever when 20 or more rural stations could be connected to a grounded return rural line. Rural power lines have made the old grounded line useless, and now since the average individual uses the telephone more frequently and for



E[illegible] strength must be built into corners on long span lines.

Storm guying is necessary on rural lines in all heavily loaded areas.

Carrier systems could probably be used to advantage on lines of this type.



Joint power and telephone construction is now generally used.

Aerial drop wire connected to a buried cable rural line.

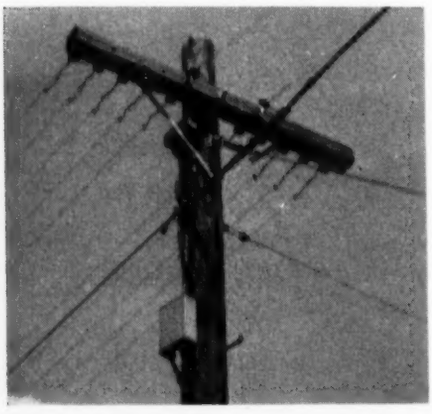
Underground cable used to serve open wire rural line plant.

longer periods of time than formerly, eight stations are about the limit that can be connected to one line in most localities if an acceptable grade of service is to be provided.

In the old days, long distance calls were seldom made from rural lines and in many cases very little attention was given to the grade of transmission. This has all changed, however, since present-day customers on rural lines use long distance service frequently and a good grade of transmission is necessary in all cases. Only recently, a friend of the writer, who lives about 10 miles out in the country from a fair-sized city and conducts his business from his home, bemoaned the fact that to date he had not been able to obtain an individual line telephone. This was true even though his toll bill averages nearly $200 monthly. In his particular case, the only service available, an eight-party rural line, has proved grossly inadequate for the proper conduct of his business. Added to the general confusion, the other seven customers on this particular line are likewise dissatisfied with the service since frequently their calls are delayed seriously by toll calls of long duration.

Because of this demand for a better grade of rural service and fewer stations per line, the present-day plant expansion problems of the average telephone company are increasing daily. On leads where three or four grounded lines once sufficed, 10 or more metallic circuits may now be required. This increase necessarily makes the use of larger poles mandatory in order to adequately support the heavy leads of open wire. Further, when open wire leads become too heavy to be economically maintained, cable must be installed if the traffic load is to be handled satisfactorily.

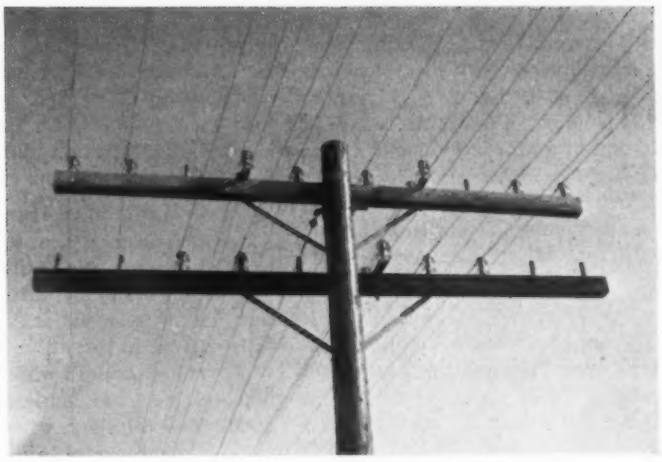
Moreover, the relatively long lengths of all rural lines, and the widely dispersed homes which they usually serve, represent a high investment per station which is not commensurate with the rates ordinarily obtained for rural service in the average community. It is quite obvious that the cost per station will be considerably more when the customers live on five-acre plots than when they reside on 50-ft. front lots, or apartments. Therefore, it is most important that in the planning of all rural line construction, a type of plant be selected which will provide the



Aerial cable connected to open wire rural lines.

Special deadending fixtures used on long span lines.

Tandem type transposition used on a bracket circuit.



LEFT: Joint cable and power line construction. RIGHT: Tandem type transpositions used on a modern rural line.

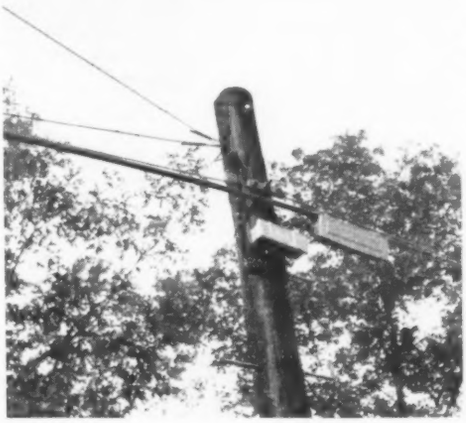
required service and transmission and, at the same time, prove economical as to both first cost and maintenance. In the construction or rehabilitation of rural plant in general, one of the following facilities probably will be considered: Open wire, buried wire, aerial cable, buried cable, carrier systems superimposed on open wire or carrier systems on power lines.

Since the beginning, galvanized steel has been the most commonly used wire on rural lines. Copper or Copperweld is also used frequently when the extra cost can be justified such as when there is a requirement for better transmission, or signalling, or where corrosion conditions are especially severe. As a rule, Copperweld steel wire is to be preferred to copper wire for rural line use as it is considerably cheaper and has a much greater tensile strength. From a point of conductivity, the resistance of Copperweld is somewhat greater than copper, however, it proves entirely adequate in the provision of the required transmission on the average rural line when greater tensile strength reliability is also a requirement.

Steel wire No. 12 BWG is the type used in most cases for rural line construction. Prior to 1935, this wire was drawn of mild steel with a breaking strength of about 500 pounds. Then a higher strength steel was made available and the breaking strength was increased to 800 pounds. Again, in 1937, still further improvements in steel raised the breaking strength to about 1,200 pounds. In 1948, the strength was once more increased to a minimum breaking strength of 1,800 pounds.

The greatest advantage to be gained by this increased tensile strength of wire is the successful use of long span construction. The spacing of poles is one of the most important elements affecting the cost of aerial rural plant construction. The lighter the wire lead, the greater the ratio of cost of poles to the total line cost. On a one or two circuit line, the poles may represent 75 to 85 per cent of the total cost. The cost of the poles roughly varies inversely with the pole spacing and the longer the spans used the lower the line costs. High tensile strength wire makes possible the successful use of long span rural construction in most rural areas of the United States.

When wire of 1,200 pounds breaking strength is used, span lengths of 350 to 400 ft. are ordinarily used in medium and light loaded areas. With the new 1,800 pound wire, preliminary tests appear to indicate that span lengths of 600 ft. average may be used with success even in heavily loaded areas, with an occasional span of greater length, when required due to unusual terrain or other reasons. It must be understood, of course, that on a line of this type, poles of greater strength will be required and corners must be constructed to handle the extra strain. Special deadending fixtures and frequent use of double crossarms may be necessary on a line using this new type of wire. The preliminary trials which have been made with this new wire indicate that although it is somewhat stiffer and springier than the older types it may be handled satisfactorily providing certain precautions are taken.



Strand type cable terminal and protector used extensively on aerial cable rural plant.

By taking advantage of the use of a reduced number of poles in rural line construction, it will prove more economical, in many cases, to provide the requisite pole strength by the use of considerably larger poles than by a greater number of smaller poles. Also, when a rural line is constructed through a hilly country the use of long spans permits greater latitude in the selection of pole locations by taking advantage of irregularities in the terrain so as to avoid the use of extra long poles in grading the line.

A reduction in the number of poles required obviously results in a correspondingly less number of poles to be dug. In this connection, the savings realized in reduced labor costs alone may prove worth while when digging in rock is encountered or where for any reason a power driven earth boring machine cannot be used. The prevention of leaning poles normally increases rapidly with deeper setting. The stability of poles increases proportionately with the depth at which they are set. When local soil conditions are of such a nature as to require special attention to pole setting, it may prove economical to reduce the number of poles by increasing the span lengths and to concentrate upon improving the method of setting the fewer number of poles by increasing the depth or by providing earth reinforcements in the form of plank anchors on the poles near the ground level.

Contrary to general opinion, the joint use of poles to support both power and communication lines is not new, as this practice has been in general use since about 1890. Actually, today there are more than 6,000,000 jointly used poles in the United States. The greater number of these poles, however, are located in urban areas where the power circuits are generally less than 5,000

volts and the span lengths do not usually exceed 150 ft. Back in the early thirties, when power lines were extended into many rural areas, new problems were encountered in the use of joint construction which were due to the use of longer spans and higher voltages on the power circuits and increased noise from induction on the telephone circuits caused by the longer parallels.

The joint use of poles for telephone and power circuits operating at voltages over 5 kc has been in service on a general basis in a number of urban areas for a notable period of time and there are now well over 100,000 poles involved in this type of construction. In the majority of these cases, the telephone lines are in cable having a grounded sheath, which provides a low impedance path to ground in the event of accidental contact with a power carrying circuit. When open wire telephone circuits are involved, the use of 3 kv carbon gap protectors are recommended to properly care for accidental power crosses. Whenever practicable, the cable sheath and protectors should be connected to the multi-grounded neutral of the power system.

When planning long span joint construction, the wire used for both telephone and power lines should be of the high tensile strength type so that its sag characteristics will not differ sufficiently to cause contacts in the center of the spans between the two services under ice and wind loading conditions or severe temperature changes. The minimum vertical separation between power and telephone wires at the pole and in the span should comply with the requirements of the National Electrical Safety Code. The minimum vertical separation for power circuits of 0-8,700 volts are 40 ins. at the pole and 30 ins. in the center of the spans; for power circuits over 8,700 volts, 60 and 45 ins., respectively.

When telephone lines are installed on jointly used power poles, a properly designed transposition system must be used. In some cases, the transpositions in the power and those in the telephone lines must be properly coordinated. In general, however, the noise on the telephone lines is not excessive if the joint lead is carefully designed and maintained. Among the reasons as to why these favorable noise conditions are obtained is that in joint use, the exposures can be made uniform, an arrangement which permits full advantage to be derived from the telephone circuit transpositions. A particularly effective transposition plan is the RI system which utilizes the tandem bracket arrangement. This plan provides frequent transpositions, usually on every other pole, and an average wire spacing of only about seven inches. Although this system was originally developed for telephone circuits on separate poles, its effectiveness and ease of installation make it highly desirable for use on joint construction.

With the tremendous present-day increase in the demand for rural telephone service, the use of cable must eventually replace heavy open wire in many localities. By this, we mean loads of over two crossarms or 10 metallic circuits which will, in many cases, prove too expensive to install and maintain, or where proper clearances cannot be obtained. Long span type construction lends itself admirably to aerial cable when used in rural plant. Not only does this type of construction reduce pole costs, but it also proves cheaper and easier to maintain. The greater amount of sheath trouble in lead covered cable occurs at or near the poles. A reduction in the number of poles in a cable lead obviously causes a corresponding reduction in trouble. Troubles due to bowing are likewise considerably less on long span cable construction than on lines of conventional span lengths. Cable, as mentioned previously, proves far superior to open wire when joint power and telephone construction are utilized in rural line plant. Cable can generally be installed on a power line so as to provide the proper separation on the poles and the correct sag in the center of the span without setting additional intermediate poles.

Buried cable proves highly desirable for rural line use; however, its high first cost often eliminates its use in this low revenue producing plant. If, on the other hand, the low maintenance cost and savings from this source over a reasonably long period of years are considered it may, under certain conditions, prove economical. In many localities, a trenching machine or a cable plow may be used to advantage and the installation of buried cable need not prove overly expensive. When buried cable is installed, careful forecast studies should be made with a view to determining the ultimate number of circuits that will be required in the area to be served over a period of years estimated as the total life of the cable. The cost of reinforcing an existing buried cable proves excessive in all cases.

Buried cable should always be installed, if possible, in locations that will never be disturbed by future road grading operations. In some localities, especially in sandy soils, lead covered cable is often installed directly in the earth without the addition of any mechanical protection. This practice is never recommended for the reason that it frequently proves a false economy in the long run. Steel tape armored cable is recommended for use on all buried cable rural line installations. Jute protected cable has been used on buried installations to some extent in the past, but it is not recommended for present-day use. This type of cable does not provide adequate protection against either electrolysis or damage by rodents, such as gophers.

The route of buried cable should be indicated properly by the use of permanently installed markers and signs. Splice locations also should be accurately indicated on all route drawings and markers in order to facilitate maintenance.

Back in the middle thirties, a great furore was raised in the telephone industry over the development of buried wire for use in our rural plant. This No. 17 parallel type wire, insulated with rubber having a hard surface jacket and installed quickly by use of a plow, was supposed to be an all-time answer to our prayers for a low cost, serviceable rural plant. Test installations were made throughout the country and for a time everyone made great plans to make extensive use of this type plant. And then the trouble began. It was soon found that lines were damaged severely by lightning even when they were entirely grounded and not connected in any manner with aerial plant. Rodents and insects damaged the rubber insulation in some localities. In severe cold climates when the ground froze, the contraction stripped the insulation and caused short circuits. Extensive damage was done by grading operations when the wire was not buried in a proper location along some country roads.

Necessary action was eventually taken to correct these difficulties even though the cost proved to be extremely high. It was learned that a bare No. 14 ground wire had to be buried with the pair in order to protect it from lightning and induced voltages. To protect the insulation from rodents and insects, two metallic steel tapes were spiraled over the rubber insulation. When this metallic shield was used, the ground wire was not required. It was learned, also, that slack had to be looped at certain intervals in cold climates if contraction were to be avoided. This practice complicated the plowing operation. Installing the wire along country roads in a location so as to be clear of all grading operations often proved extremely difficult as well as expensive. We do not have any data on the installation of long rural lines using buried wire during the past

(Please turn to page 53)

PROTECTION FOR EXCHANGE *Telephone Circuits*

By M. F. NOSTER
Plant Engineering Dept.
Southwestern Bell Telephone Co.
San Antonio, Tex.

[**EDITOR'S NOTE:** *This article describes Western Electric protection equipment, however, Independent manufacturers make similar equipment.*]

* * *

SAFELY built and properly protected plant is an obligation to telephone employes. The same is also an obligation to subscribers and the general public. First, we want to protect lives and next property is given consideration.

Economy along with sound engineering determines how much protection is applied. This means that an extremely large pole would not be used where a smaller one would meet the accepted strength requirements, etc. Also, electrical protection devices would not be installed where study indicated that their need was unlikely.

One hundred per cent plant protection cannot be guaranteed. The value of protection must be weighed in the light of expected requirements. We expect some plant damage.

What Are We Protecting from Electrically?

Telephone plant is protected from the following two classes of interference:

(1) Against currents and voltages used in the operation of the communications system.

(2) Against currents and voltages impressed on communications systems due to conductive or inductive effects from power systems, and lightning.

In the first class, the telephone plant is designed with sufficient insulation to withstand operating voltages and with current carrying capacity to withstand normal currents. Resistances or fuses are used to limit the normal current.

In the second class, it would be impractical to design telephone wire plant that would withstand voltage or carry current from many outside sources. Therefore, protective devices are used to protect both life and plant. These outside currents and voltages may come from direct contact with power lines, induction from either power currents or voltages in paralleling lines, magnetic storms, lightning, and earth potential differences.

It is of utmost importance to build plant with standard and recommended clearances and separations in order to avoid contacts with power wires and to prevent wire breaks or interference with "passers-by." Also, since service is being provided in all areas now by both power and telephone companies, it is impossible to avoid close or paralleling lines This means that much closer coordination work is required now than ever before to prevent both shock hazards and noise interference.

Electrical Strength of Equipment And Plant

Telephone equipment and wiring varies in size and design in accordance with its intended use. Some equipment handles very small currents whereas other carries hundreds of amperes. Insulation must be such that there is a safe margin above normal telephone plant voltages.

The most common voltages used are 24 and 48 volts dc for talking and signaling and up to about 160 volts peak ac for ringing purposes. Telegraph circuits employ both positive and negative 135 volts to ground. Some special circuits employ as much as 1,000 volts to ground but these would usually involve toll circuits.

Commonly used cables pass a conductor-to-sheath insulation test of 1,000 volts 60 cycles and a conductor-to-conductor test of 350 or 500 volts, 60-cycle, on a sampling basis. From a lightning or impulse test standpoint these cables will withstand about twice the amounts of voltage as indicated above.

What Induced Voltage to Expect

Voltages and currents are induced into telephone lines from both power currents and power voltages. Sometimes one is much more important than the other.

Induction from currents is usually important when large load currents or fault currents are flowing in paralleling power lines and great plant damage could be encountered. The length of the exposure is very important. In very short exposures there may be no problem. Also the separation of lines determines the induced effects.

Induction from power voltage is dependent upon the resultant voltage on the power line. This means that a three-phase line voltage may not disturb greatly, but a two or single phase line may induce great amounts of voltage upon the paralleling telephone line. For instance, telephone lines built jointly with single phase 7.2 kv power lines will have approximately 850 volts induced into them before they are drained by cables, central office equipment, ringers, or some drainage device. If the same lines are at 30 ft. roadway separation, 400 volts would appear or at 60 ft. separation about 150 volts. This induction varies directly with the magnitude of the resultant power voltage and is reduced greatly when other wires appear between the two lines and form shielding. A workman will receive shock from these induced voltages if his body is grounded and the greater the length of exposure the more current will be delivered through the body. Deaths have resulted. The induced voltage remains constant for any length of uniform exposure.

Types and Characteristics Of Protective Equipment

There are used in the telephone plant, as in the power system, two general types of protective equipment:

(1) Devices to limit potential consisting of protector blocks or gaps in the telephone plant and lightning arresters or other devices in the power system.

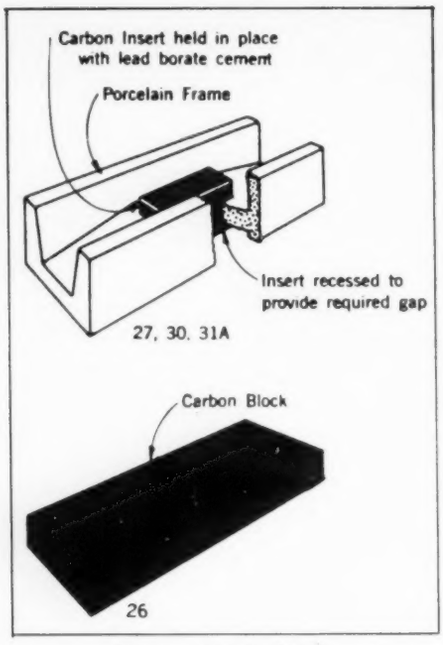


Fig. 1. Protector blocks.

(2) Devices to limit duration of abnormal currents consisting of fuses or fine gauge cable and heat coils in the telephone plant and fuses and circuit breakers alone or in combination with relays in the power system.

Protector blocks are an arrangement which provide a small air gap between a conductor and ground. Two blocks are employed. One of the blocks is of carbon and forms the ground electrode. The other is of porcelain with a small carbon insert held in place in the porcelain block by means of lead borate cement. The carbon insert is connected to the line conductor and is depressed slightly below the bearing surface of the porcelain block so that when the two blocks are held together by a spring, a small air gap exists between the carbon block and the carbon insert. Typical protector blocks are shown in *Fig. 1.*

A ground on the telephone conductor is established when the potential difference between these electrodes is high enough to cause arcing across the gap. In some cases of severe discharge, the air gap may be bridged and cause permanent grounding. If the discharge is prolonged, the heat produced may soften the lead borate cement and allow the carbon insert to be pushed against the carbon block by the supporting spring, thus permanently operating the protector. The protector block combinations in use are listed in the table below:

Code Designation	Gap	60-Cycle R.M.S. Breakdown Voltage	Common Use
26*-27	.003″	350	C.O. and station protection (½″ centers).
28*-29	.003″	350	C.O. protection (⅜″ centers)
26*-30	.006″	700	Cable protection
26*-31A	.010″	1,000	Special application

* The 26 and 28 blocks are carbon.

There has recently been developed a cylindrical type of protector block assembly of the general appearance shown in *Fig. 2.* The principle of operation is similar to the blocks described above. Their advantage over the 26-27 type is that they may be mounted in a well sealed chamber, thus reducing the chances of moisture trouble. The 107A type assembly will be used in the 106 station protector. The 107B type assembly (illustrated in *Fig. 2*) used in protected cable terminals differs from the 107A in that in the capsule a lead pellet is provided between the carbon disc and the cap. Under sustained power current discharge, this pellet will melt and allow the metal assembly shell to be pushed into direct contact with the cap. This increases considerably the current that the mounting will carry without opening the line from ground.

Fuses: When protector blocks break down on an abnormal potential, a current will exist in the telephone line conductor, the protector mounting and the ground wiring associated with it. It is the function of the fuse to interrupt this current, where necessary, before overheating of the wiring and mounting occurs. The fuses used for this purpose in the telephone plant will carry seven amperes continuously and will operate in less than five minutes on a current of 10.5 amperes. When used in station protector mountings, this fuse will interrupt without sustained arc-over, currents resulting from contacts which create up to about 3,500 volts across the operated fuse. This feature is obtained by coordinating the fuse and mounting design.

The selection of seven amperes as being the most suitable rating of the fuse for use in the telephone plant for protection against excessive currents from foreign power sources was the result of a careful consideration of safety and maintenance factors. Fuses in the low capacity range, say five amperes and less, are subject to frequent operation on lightning surges. Such operation performs no useful function since the protector blocks, mounting and associated ground wire can withstand substantial lightning currents without failure. Also, the voltage across a surge-operated fuse is high enough to sustain the arc for the duration of the lightning surge. The possibility of contacts between the telephone plant and 6.6-ampere constant current series street lighting systems was also important in determining fuse size. When these lighting systems are open-circuited, the apparatus associated with them attempts to maintain 6.6 amperes by raising the

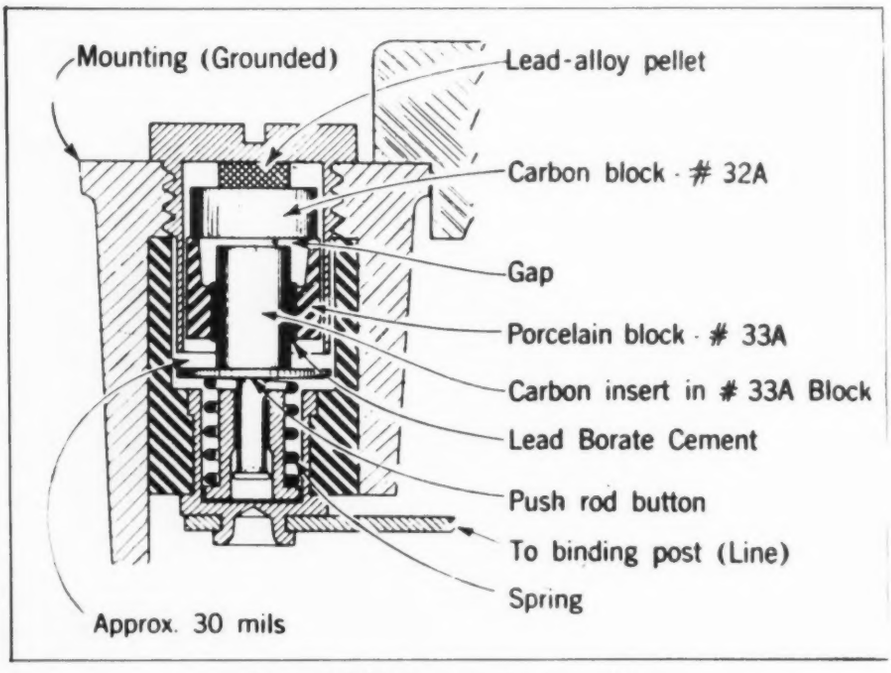


Fig. 2. Cylindrical protector block assembly.

circuit potential. Should one of the conductors of such a system contact a telephone conductor and cause a protector fuse to operate, it would be possible for the raised voltage to appear across the fuse mounting with consequent chance of arc hold-over. To avoid this possibility the telephone circuit fuse should be able to carry 6.6 amperes continuously. A seven-ampere fuse fulfills this requirement.

Increasing the capacity of the fuse above seven amperes would provide some reduction in unnecessary operation on severe lightning surges, such as might occur on rural open wire lines. This improvement, however, would reduce the ability of the protector to perform its function of protecting against telephone plant contacts with power distribution circuits. The fuse and associated station protector blocks must reduce to the greatest extent practicable at the time during which the telephone station inside wiring and equipment are subjected to power system voltages as a result of contact in the outside plant. It is on the basis of considerations as outlined above that seven amperes has been selected as the most advantageous fuse size and experience over many years has shown the choice to be a good one.

99A Protector: As pointed out above, the station protector will adequately handle voltages up to about 3,500 volts

(Please turn to page 59)

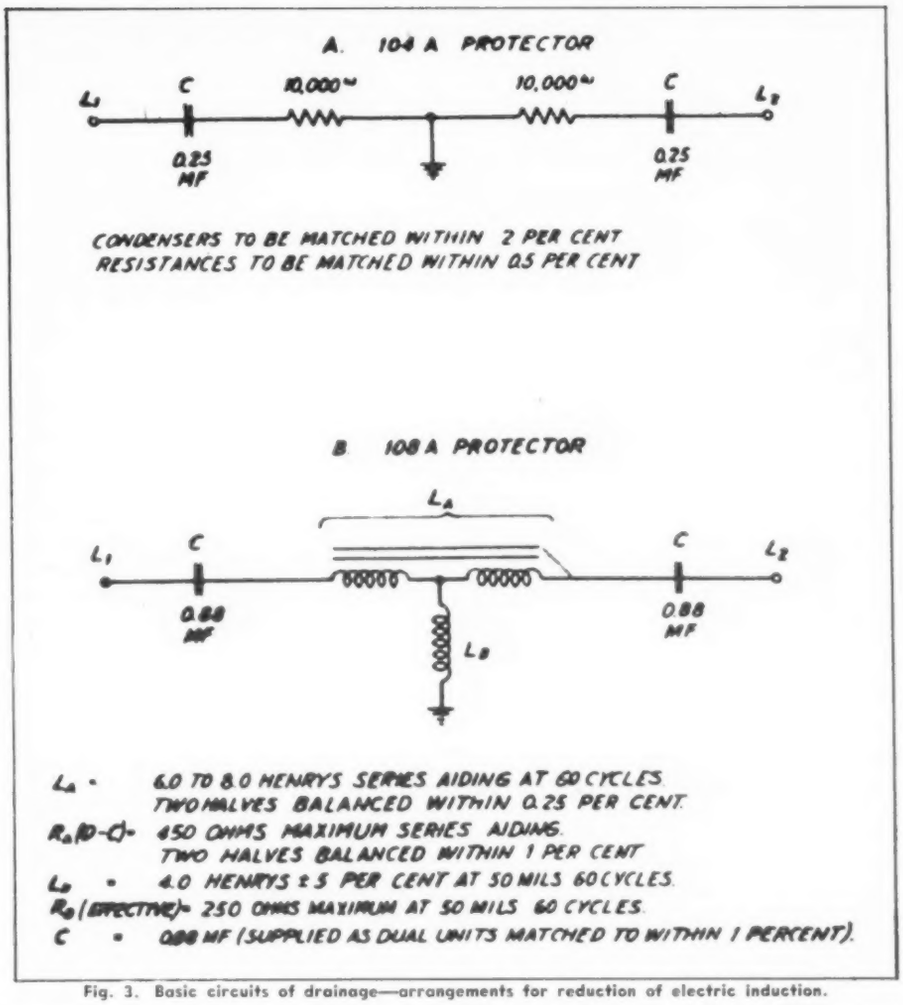

A. 104 A PROTECTOR
C
10,000Ω
10,000Ω
C
0.25 MF
0.25 MF
CONDENSERS TO BE MATCHED WITHIN 2 PER CENT
RESISTANCES TO BE MATCHED WITHIN 0.5 PER CENT
B 108 A PROTECTOR
C
C
0.88 MF
0.88 MF
6.0 TO 8.0 HENRYS SERIES AIDING AT 60 CYCLES. TWO HALVES BALANCED WITHIN 0.25 PER CENT.
450 OHMS MAXIMUM SERIES AIDING. TWO HALVES BALANCED WITHIN 1 PER CENT
4.0 HENRYS ± 5 PER CENT AT 50 MILS 60 CYCLES.
250 OHMS MAXIMUM AT 50 MILS 60 CYCLES.
.088 MF (SUPPLIED AS DUAL UNITS MATCHED TO WITHIN 1 PERCENT).

Fig. 3. Basic circuits of drainage—arrangements for reduction of electric induction.

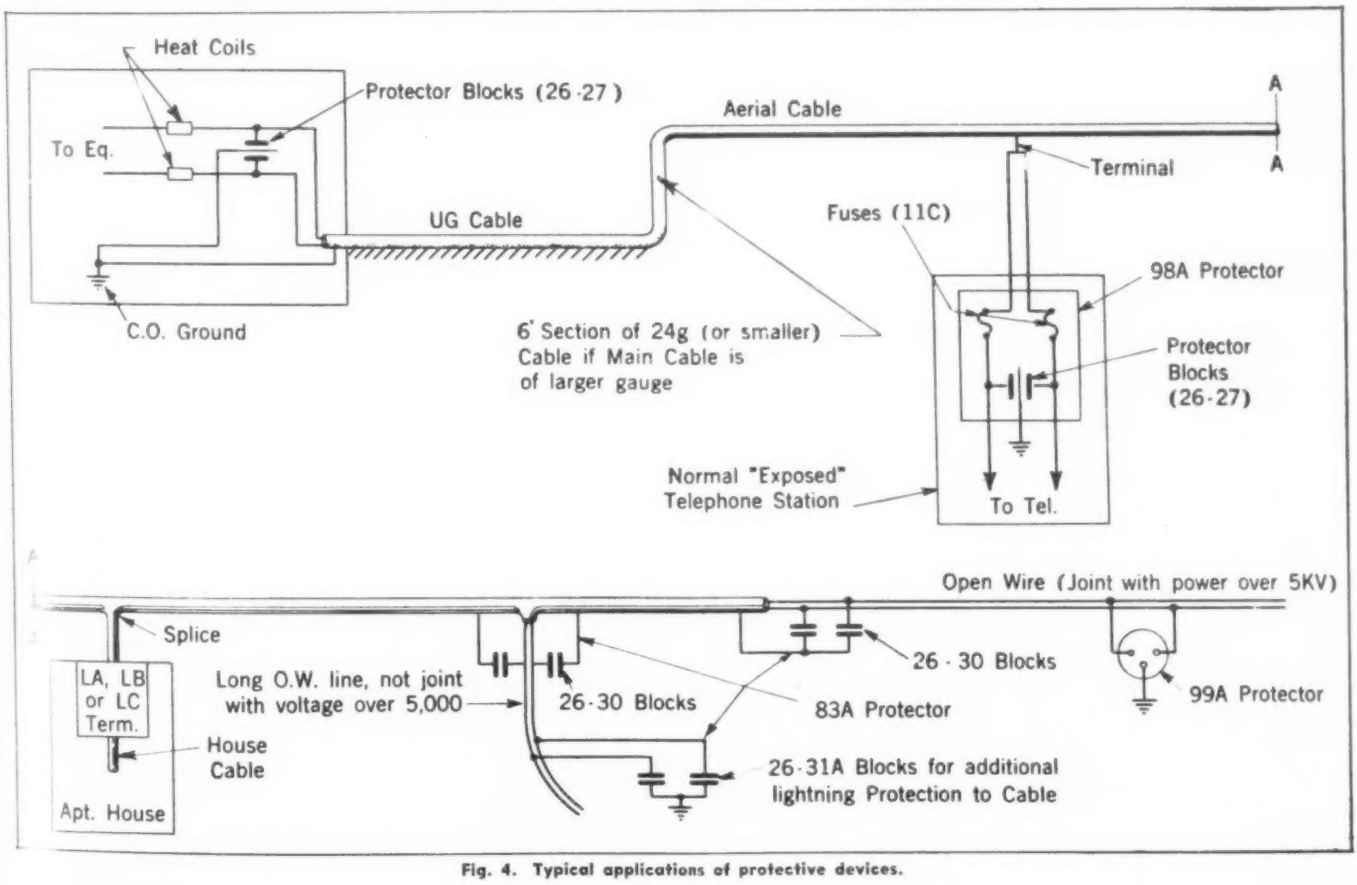


Fig. 4. Typical applications of protective devices.

telephony's *SAFETY* bulletins

No. 18—What Does Safety Mean to You? The word "safety" may have a different meaning or take on an individual interpretation when considered by various people. No matter how you look at it, safety means "be careful" and "avoid injuries."

by FRANK E. LEE

WHAT does safety mean to you? This is an important question. Equally important is your own answer.

To be effective, a safety program must have an over-all objective. Also, a safety program must have a distinct personal meaning to each individual. The merit and success of any safety program hinges upon how much the meaning of safety will encourage or impel a person to work safely. From the standpoint of a good safety program, the understanding of all phases of safety is most important. It should not be an intangible aura of activity—a person should be able to grasp literally the feeling of safety in his own two hands. He should be able to assign concrete reasoning to his individual safety program. Thus, the purpose of safety will be clearly defined.

Why should you work safely?

First—consider the over-all objective—an accident-free operations record. This is of prime importance to every operating company, but especially so to the small company.

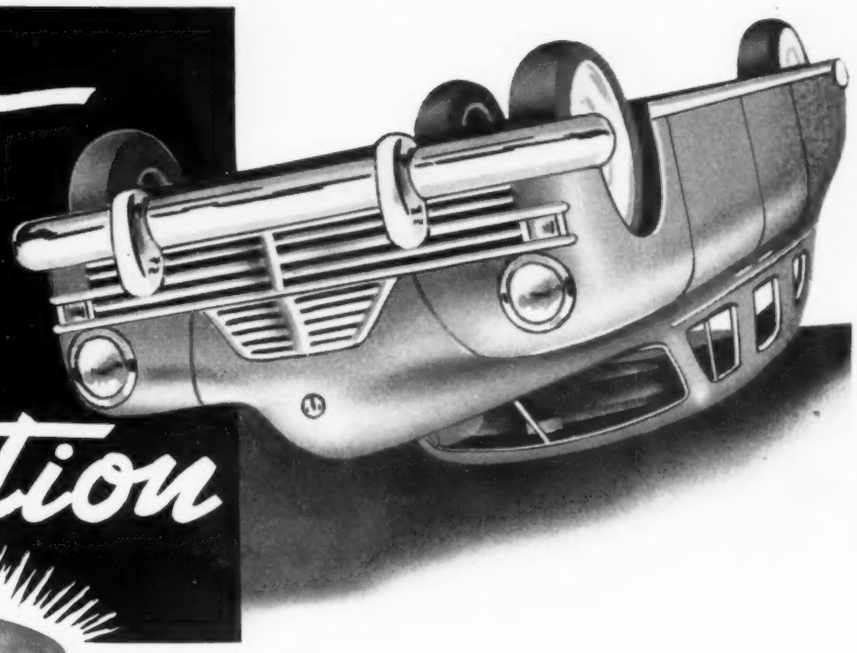
Each person may have his own reasons for working safely. To some people, the human side of safety is the most important consideration. To others the fact that accidents cost money is the first thought. A perfect service record may figure first to another individual, while still another may work safely as a matter of personal pride—to mention a few of the reasons for safe practices. Regardless of which of these reasons is foremost in the individual's mind, they all work for an accident-free operations records, and the wise training supervisor will stress each reason in the safety instruction. Only in this manner can he hit the right approach to all the various individuals in his department, or company.

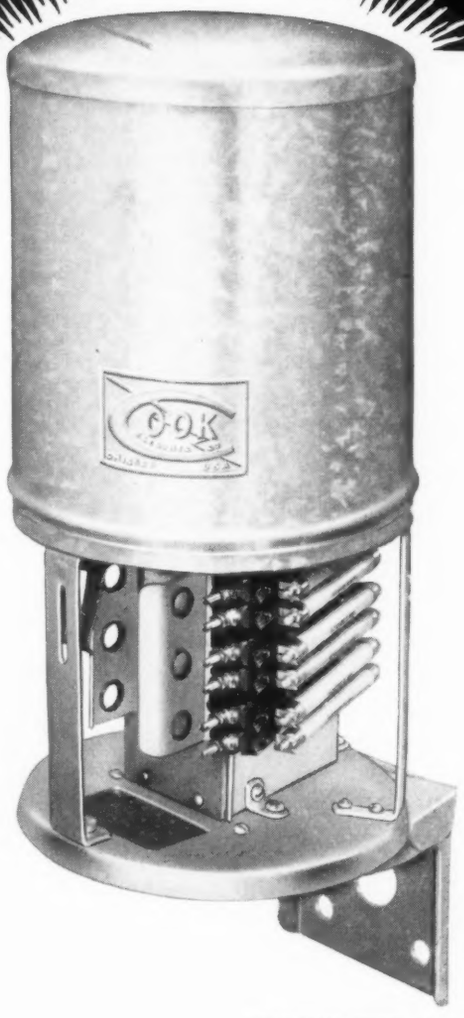
To begin with the human side of safety, do you like to see a person suffer from an injury or accident? No, indeed. Few people do. Safe practices can prevent painful injuries, as they are caused by accidents and there is a cause for every accident. Avoid the accident and you prevent injury. Remember—the injured person could be you—or, and this is especially true in a small operating company—the injured person may be a very good friend or neighbor of yours.

The human side of safety extends further than to one individual in a group. Other people may get hurt by another's careless actions. These other people may be members of a line gang, they may be bystanders, customers,

(Please turn to page 36)

Turret Top Protection





LIKE your automobile body top, the new Cook "Turret Top" hood cap is now made of one piece deep drawn steel. The steel in the hood is 25% thicker than previous manufacture, with no increase in weight due to the new design features. It carries a 200 pound man supported on one foot without showing indentation or distortion. The new hood is of all-welded construction with side reinforcement, and hot dipped galvanized. It is easy to slide over the hood guides and provides for greater strength, longer life and improved appearance. Its greater protection further adds to the durability of all Cook Protected Pole Cable Terminals.

These improvements are now incorporated in all of the already famous Cook Protected Pole Cable Terminals without additional cost to the user.

Now Used on Cook
S-20, S-6
S-16D, UA-20
Protected Pole
Cable Terminals

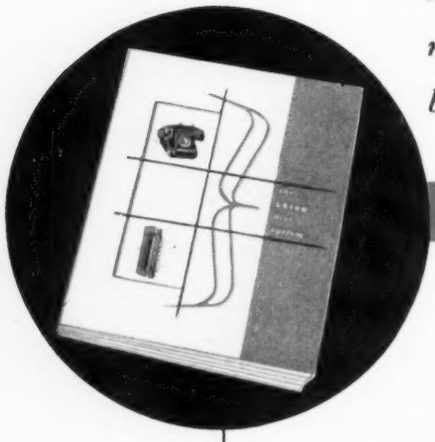
RECOMMENDED AND SOLD THROUGH OUR DISTRIBUTORS

COOK ELECTRIC Company

2700 SOUTHPORT AVENUE CHICAGO 14, ILLINOIS

THE NEW LEICH DIAL SYSTEM

This is the most simplified dial switchboard you've ever seen. It has fewer, less complicated parts and less to get out of order. With this Leich Dial System you can convert to dial faster, with less expense and less trouble. Any good telephone man can learn to operate and maintain it. All parts, including lines and links, are jacked in. You can't make a bad guess about future expansion. No matter how large you grow, the original equipment can be added to with a minimum of expense, time and trouble. All this may sound almost too good to be true, but it most certainly is. The literature described below gives the complete story.

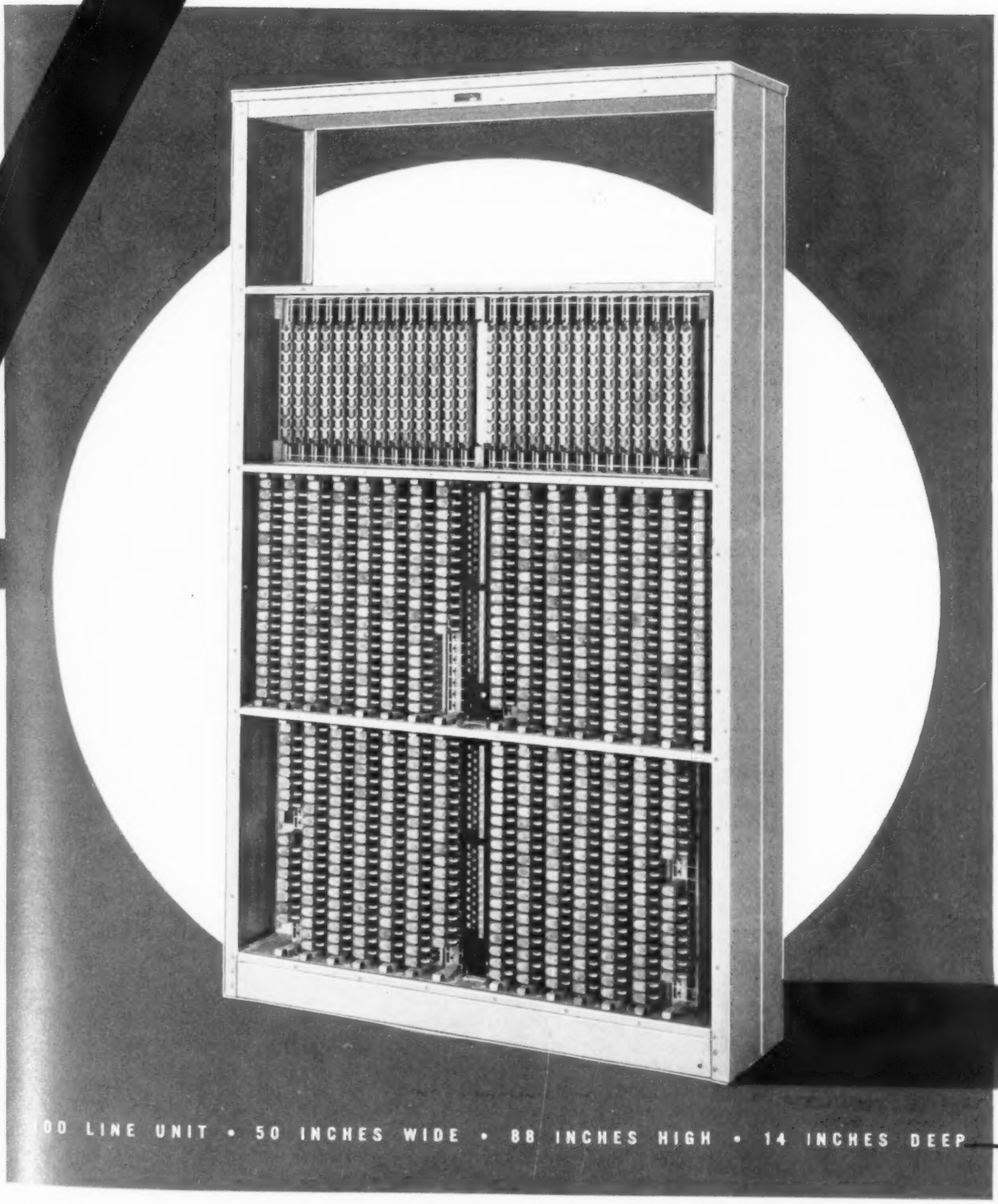


COMPLETE INFORMATION NOW AVAILABLE

A 20 page illustrated catalog, which describes the new Leich Dial System in complete detail, is now available. Send for your copy today. No charge or obligation. Leich Sales Corporation, 427 West Randolph Street, Chicago 6, Illinois.

Leich MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 19

a better, easier way for the smaller exchange to convert to dial



100 LINE UNIT • 50 INCHES WIDE • 88 INCHES HIGH • 14 INCHES DEEP

or children. No matter who is affected, from the human standpoint we do not like to see anyone hurt.

Not only the injured person, but others may suffer, also. Often the family of the injured person endures mental and physical hardships as a result of the accident. If, to you, the alleviation of human suffering is the most important consideration when thinking of safety, then use the human side as your means of approach to safety problems. Think—will there be a chance of injury to someone?

ACCIDENTS COST MONEY

To other individuals accidents are to be avoided because they cost money. While few of us think solely of the money angle in this respect, nevertheless, it is an important consideration to the company and to the individual. Accidents do cost money. Damaged motor vehicles cost money to repair. Broken tools or damaged equipment and material items cost money to replace. Hospital and doctor bills can climb fast in an accident case. An accident almost always means some loss of earning power, and also may mean a drop in revenue. An accident may delay the completion of a project to provide additional revenue producing plant. Delays of this type cost money in lost revenue and should be charged directly against the accident as a cost item.

Investigation, analysis, and final disposition of most accidents cost additional sums of money. Too often these hidden costs in lost production hours are overlooked when studying the cost of an accident.

If to you safety is important for the savings of cash money it entails, then use the cost theme as your means of approach and interpretation of safety problems. Remember, consider all cost and money and items involved and you will "buy" the safety program.

SAFETY HELPS A GOOD SERVICE RECORD

Perhaps your prime interest and objective is an excellent service record for your telephone company. In this respect you are zealous in your efforts to keep appointments and other commitments to your customers. Such feelings are not unusual in the telephone business. Telephone people are justly proud of their short time appointments and on-time completions.

An accident will foul up a good service record. If a small company is operating with one maintenance and installation man, its position is especially vulnerable from the accident standpoint. A telephone maintenance man cannot repair a telephone from a hospital bed. If to you safety represents a way to maintain a good service record, let this logic enter into your safety reasoning.

TO MANY, SAFETY MEANS PERSONAL PRIDE

Did you ever hear of a man who was too proud to get hurt? In many instances an accident can have a reflection on a man's pride. Sometimes stupid blunders cause an accident. Most people resent anything which may tend to make them appear stupid in the eyes of other people. The answer is to do each job the safe way and maintain your pride by avoiding accidents.

Yes, safety has many interpretations and meanings. A safety program will be effective only to the extent that its scope and meaning are understood by those who participate in the program. In addition to the considerations mentioned, there are many other factors. As a general rule, each person's safety logic embraces many of these factors, with possibly one or two of these ideas predominant. A combination of all of these ideas will benefit for a sound workable safety program.

This series of bulletins is being developed by TELEPHONY to provide small and medium operating companies with information that will form the basis for a workable safety program. Read the bulletins for ideas and for material to stimulate discussion in your regular safety conferences.

Remember, YOU HAVE TIME FOR SAFETY.

Telephone Co-op Bill Rejected in Mississippi

Proposed legislation to permit the formation of rural telephone cooperatives in Mississippi was rejected on Apr. 11 by both branches of the state legislature.

The defeated measure was a compromise version of senate and house views worked out in a joint conference. Majorities in both legislative branches objected to placing proposed cooperatives under the jurisdiction of the Mississippi Public Service Commission.

The bill would have required the cooperatives to obtain a certificate of public necessity from the commission, which also would have been empowered to approve all rates and other operating regulations. The requirement was contained in the original senate bill, eliminated by the House and reinsated in the conference report.

It was provided in the controversial section of the conference report that if one applicant's petition covered a small area and another's covered a larger area, "if the commission finds that a wider number of rural users will be served by granting the certificate to embrace the entire area it shall not consider such proposal of service for the smaller area."

It also provided that if "it appears that the proposed area will receive in a reasonable time reasonably adequate service, the commission may order that there shall be no duplication of lines or facilities."

V V

Porter Named Manager At Texarkana, Tex.

L. L. Porter has been appointed district manager of the Two States Telephone Co., Texarkana, Tex. The announcement was made recently by Roy Autry, president of the Southwestern Associated Telephone Co., Dallas, which recently purchased the Two States company.

Mr. Porter was traffic and commercial supervisor of the Two States company at the time of its purchase by Southwestern. He has been with the company for the past 13 years except for three and one-half years during which he served in the armed forces during World War II.

He joined the company upon completion of his studies at Vivian, La., high school and Texarkana Business College where he took a course in accounting.

He began in the company's accounting department.

Easter Storm Damages N.W. Bell Plant

An Easter Sunday storm which carried over into Monday caused more than a one-half million dollar damage to the Northwestern Bell Telephone Co. plant in northeastern Iowa, southern Minnesota and northeastern South Dakota.

Freezing mist and rain, accompanied by 35 to 60-mile per hour winds, was responsible for the second heaviest damage amount this year, and brought Northwestern Bell's winter storm cost total to nearly $2,000,000. In some places ice that formed was reported to be as much as one and a half inches thick on the wires.

Clinton, Iowa, was the largest of the 236 exchanges isolated. There were over 1,500 toll circuits out, and 9,500 town and rural telephones were out of service.

Five airplanes were used in damage surveys, mobile shortwave radio bridged gaps and over 1,000 men—160 construction crews and maintenance people—worked all week to restore service.

V V

It has been said: "Learning is like rowing upstream; not to advance is to drop back."

Produced for *Performance*—
Packaged for *Protection*

1,000-FOOT LENGTHS
FOR YOUR CONVENIENCE

GENERAL CABLE
TELEPHONE DROP WIRES

General Cable Drop Wire will keep speech transmission clear and static free—years longer. Two General Cable SERVICE-TESTED Drop Wires—Gencatel and Neotel—are manufactured to exacting standards to give long, trouble-free service.

Gencatel drop wire is light and tough. The polyethylene covering provides complete immunity to extremes of weather and damaging effects of moisture.

Gencatel's abrasion, crushing, and moisture resistance is far superior to conventional braided telephone wire. Transmission characteristics of the wire remain stable over a wider temperature range. Available in two types, Twisted Pair, No. 212, and Parallel Pair, No. 202.

For your heavy duty drop wire applications choose Neotel. Tough neoprene covering protects the insulated wire from abrasion, even where tree conditions are present.

Neotel will not blister in the sun, or crack, even when bent at a sharp angle, at temperatures as low as 30°C. Three types available, Reinforced Parallel Pair, GPR, Parallel Pair, GP, and Twisted Pair, GT.

Manufactured for

AUTOMATIC ELECTRIC

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

IOWANS' SMALL COMPANY *Plan In High Gear*

By R. C. RENO

THE Iowa Independent Telephone Association, through its officers and directors, has proved the old adage that "to get a job done, you have to put people to work." It has applied this theory in its efforts and program to aid the small telephone companies in Iowa. Judging by the report of the association's Small Company Committee and its activities at the association's annual convention on Apr. 4 and 5, this theory of helping many small companies "get themselves on their feet" financially is paying off from a sound operating standpoint.

The association has 24 members on its Small Company Committee, broken down into a general committee of three members and five district sub-committees composed of 21 members. The district committees, under the direction of the general group, work with and advise companies, in their respective areas, which need assistance.

The plan of the Iowa association in helping small companies solve their problems is a model that could be adopted in other states. There is no doubt in the writer's mind that if such a program had been in existence not only in Iowa, but throughout the country, during the past decade or two, the "planners" in Washington would never have had a chance of succeeding in bringing about the government's entrance into the financing of rural telephone service.

Along with the work of the Small Company Committee, the Iowa association has been conducting a membership campaign during the past few months, under the guidance of a 23-member committee, also broken down into a general committee and five district subcommittees. Members of the committee have brought in 35 new *small company* memberships during that short period of time.

That the activities of the small company and membership committees have been worthwhile was evidenced by the record attendance of small company representatives at the association's convention.

As a further aid to the small companies, the association set up a convention headquarters room for the Small Company Committee where its members could meet with representatives of any small company to discuss the latter's problems and render any service deemed necessary. Needless to say, the committee members were kept busy during the two-day meeting.

The convention passed a resolution commending President Clyde McFarlin, Montezuma, and Secretary W. F. Miller for their able leadership of the association and to the various association committees, composed of almost 100 members, for their work during the past year.

W. F. MILLER

The convention passed a resolution demanding abolishment of the "tremendously unfair, illogical, discriminatory and ruinous excise tax" on telephone service.

It said "the classification of telephone service as a luxury" is both ridiculous and an insult to the intelligence of the American people.

In another resolution, the association suggested that terms of Rural Electrification Administration (REA) rural telephone loans requiring payment of 3 per cent annually on principal would make it impossible for many companies to meet the loan, operating costs, taxes, etc., out of present income.

The resolution also asked the REA to give "honest preference" in making loans to companies now serving an area, "over new companies organized to get into the telephone business with government capital and to compete with existing companies."

The association in the same resolution pledged cooperation with the new REA telephone division, and also "to make a united defense against any and all attempts to undermine public confidence in existing telephone companies or to destroy their investments."

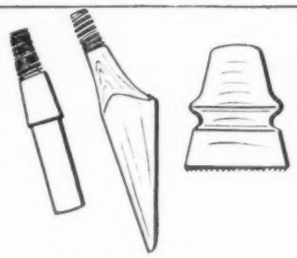
In his annual address, President McFarlin gave a thorough and detailed summary of the work that the Iowa association had done in regard to protecting the industry's interests in connection with the federal minimum wage bill, regulations of the wage and hour administrator governing wage rates of learners and amendments to the Rural Telephone Loan Act, which protect the industry against competition from government financed cooperatives.

In closing his address, Mr. McFarlin stated:

"I have spoken several times about demands for improved service, and I think if we are wise we will do our very best to anticipate these demands. I know of no better way to improve public relations than to continue to improve service before demands for such improvement are made.

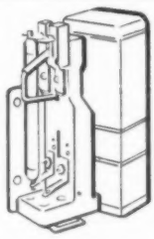
"The rapid growth of our industry might well be termed one of the miracles of our modern time. With over 40,000,000 telephones in service in our country, being almost 60 per cent of the world's telephones, we have the finest communication system in the world. It has been built by private enterprise. In fact, until the present time, the telephone industry has been one of the few remaining examples of undiluted free private enterprise. We believe in private enterprise, and we believe in a democratic form of government. We believe individual rights can only be preserved if private enterprise is preserved.

BUCKEYE—*The Complete Supply House*

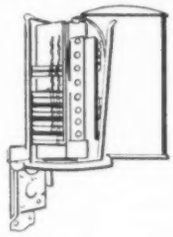


PINS, BRACKETS
and INSULATORS

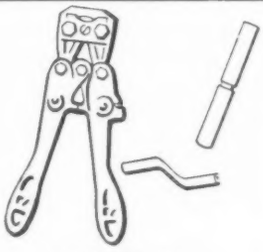
COFFING HOISTS
and LOAD BINDERS



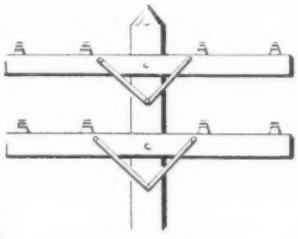
SUB-STATION
PROTECTORS



CABLE TERMINALS

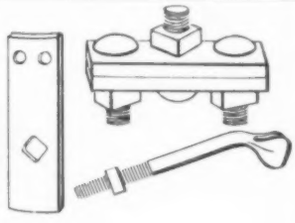


NICOPRESS
TOOLS and SLEEVES



POLES and
CROSS ARMS

INSULATED and
UNINSULATED WIRE

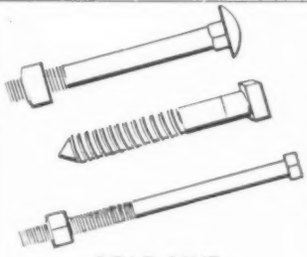


GUYING MATERIAL

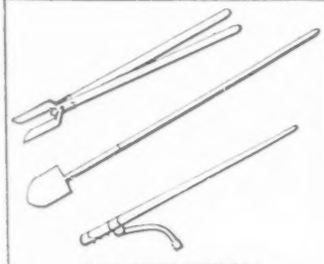
RINGING
CONVERTERS

PORCELAIN
PRODUCTS

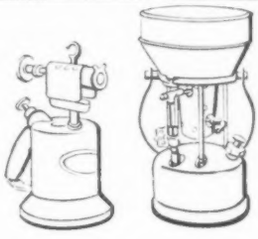
STORE ROOM
EQUIPMENT



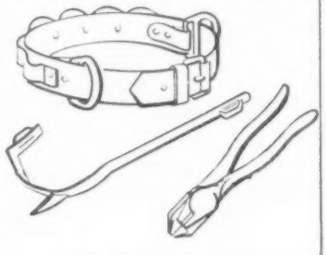
POLE LINE
HARDWARE



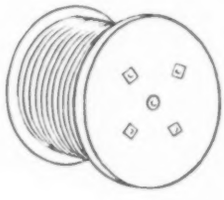
CONSTRUCTION
TOOLS



CABLE SPLICERS'
EQUIPMENT



LINEMEN'S TOOLS



TELEPHONE and
SWITCHBOARD CABLE

BUCKEYE FOR PROMPT SERVICE

BUCKEYE FOR COURTEOUS SERVICE

BUCKEYE FOR FRIENDLY SERVICE

BUCKEYE FOR SPEEDY SERVICE

BUCKEYE TELEPHONE & SUPPLY CO. COLUMBUS 6, OHIO

"It is, therefore, our duty not only to preserve and protect our industry, but, as American citizens, to do all we can to preserve private enterprise. In spite of governmental interference and threats of state socialism, I believe our future lies in our own hands. If we do our job well, and satisfy the public, keep our houses in order in a financial way, we can defeat these attempts to socialize our industry. We must not be timid in defending our industry and private enterprise from the attacks of those who would destroy our American way of life."

In commenting upon the work of the association, Secretary Miller stated that it is "heartening to observe tangible evidence which points to the fact that the Iowa association is getting somewhere through greater cooperation of individual efforts of all of its members." He said:

"I do not mean to imply that in the many years in the past we have not accomplished many things collectively which could not otherwise be accomplished as individual companies, but, in the past year there has been ever increasing evidence of more cooperation, more spirit of general helpfulness manifested on the part of many operating people throughout the state than ever before.

"I regard this broadened and increased activity and increased interest in the industry, for which the association is merely a vehicle for coordination of your efforts, as a tribute to you folks. Whether you fully realize it or not, your presence at this convention marks you as leaders in the industry.

"President McFarlin has made reference to some of his activities in Washington. His natural modesty did not permit him to say that in the past 12 or 14 months, he has spent at least a full 60 days in Washington in your behalf, and this is exclusive of travel time, which is considerable. Thus, from the president on down, this association, your association, has become an active, hardworking group for your common good, and the good of the order."

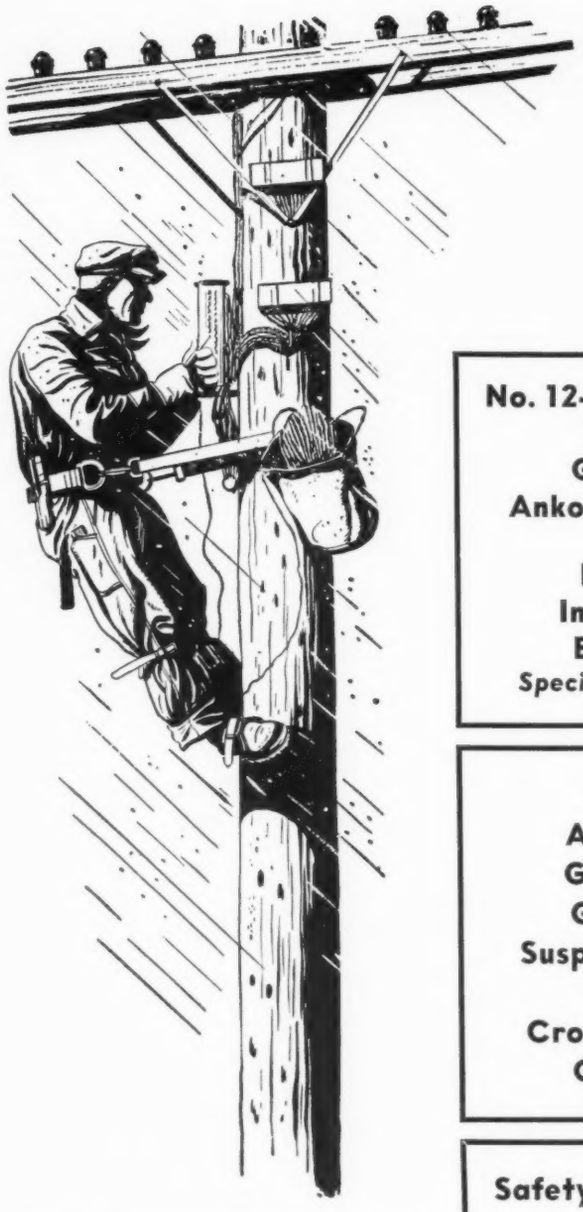
Four major problems confronting the telephone industry were listed by W. C. Henry, Bellevue, Ohio, chairman of the Committee on Problems of Small Companies of the United States Independent Telephone Association. Mr. Henry spoke on "Some of Today's Problems."

He said that today all telephone companies face the problems of (1) providing service for all who want it; (2) improving the quality of service; (3) raising rates to adequately cover operation expenses and to produce sufficient earning to attract capital for expansion and improvement of plant, and (4) securing the necessary capital.

Most of Mr. Henry's remarks were directed toward the federal Rural Telephone Loan Act. He stated that as

(Please turn to page 44)

The above photos were taken in the corridors at the Iowa convention.



LINE

Construction Supplies

(Available Promptly)

No. 12-"85" Galvanized Line Wire Guy Strand Ankoseal Telephone Cable Drop Wire Interior Wire Bridle Wire *Special Prices—Write*	Nicopress Sleeves Glass Insulators Oak Pole Brackets Cross Arms Locust & Oak Pins Drop Wire Clamps SnubR Grips Drop Wire Clips
Anchors Anchor Rods Ground Rods Guy Clamps Suspension Clamps Brackets Cross Arm Braces Guy Guards	Arming Bolts Machine Bolts Carriage Bolts Gal. Wood Screws Galvanized Nails Pole Steps Drive Hooks Washers
Safety Belts & Straps Climbers Pliers Tool Bags Canvas Buckets Gloves Plastic Plier Handles Rope	Cant Hooks Pike Poles Tamping Bars Shovels Ladders Reels Diggers Slack Pullers

MAGNETO TELEPHONES

Dan Mac Steel Handset Wall Telephone, Hotel Style
1600 ohm $20.00
2500 ohm 20.50

Dan Mac Bantam Handset Wall telephones, with battery compartment
1600 ohm $22.00
2500 ohm 22.50

Leich No. 901 Wall or Desk Handset telephone
1600 ohm $29.35
2500 ohm 29.55

All ready for shipment
All guaranteed

Phone Rogers Park 4-3818 when in a RUSH

DANIEL H. McNULTY
President - Manager

TELEPHONE REPAIR & SUPPLY COMPANY

1760 Lunt Ave. • Chicago 26, Illinois

RURAL CONSTRUCTI

Get Ideas from this Handy Book

If new construction means a bus spr
you, let Automatic Electric help you
Mail coupon or write for these two b

Call Automatic Electric, too, for al
need. You'll get top quality products
manufacturers—and you'll get them q
Automatic Electric warehouse nearest

Just Telephone You

HAYMARKET 1-4300
1033 W. Van Buren Street
Chicago 7, Illinois

RE
3626
Los

HARRISON 4720
2021 Main Street
Kansas City 8, Missouri

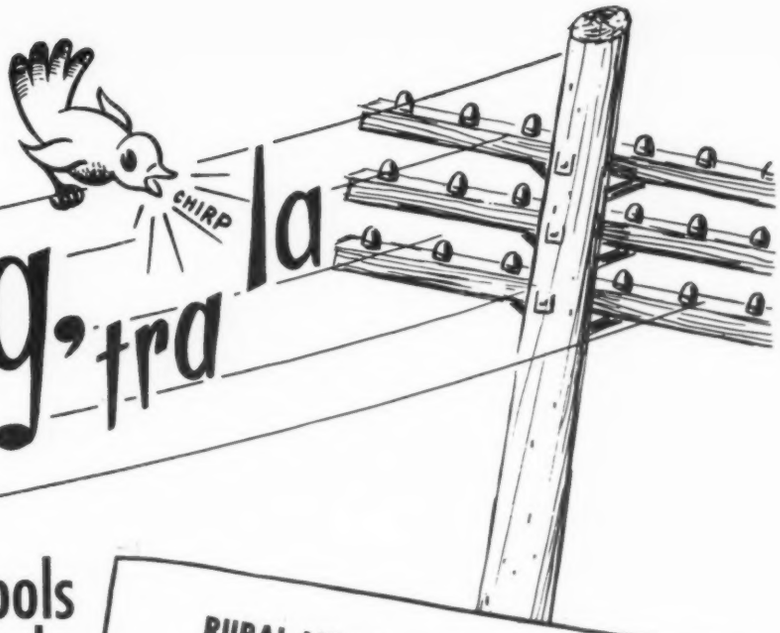
AUTOMATIC

Originators and Developers of the Strowger Step-by-Ste
Sender-Translator Operation . . . Machine Switching
Makers of Telephone, Signaling and Communication Apparatus for Electrical

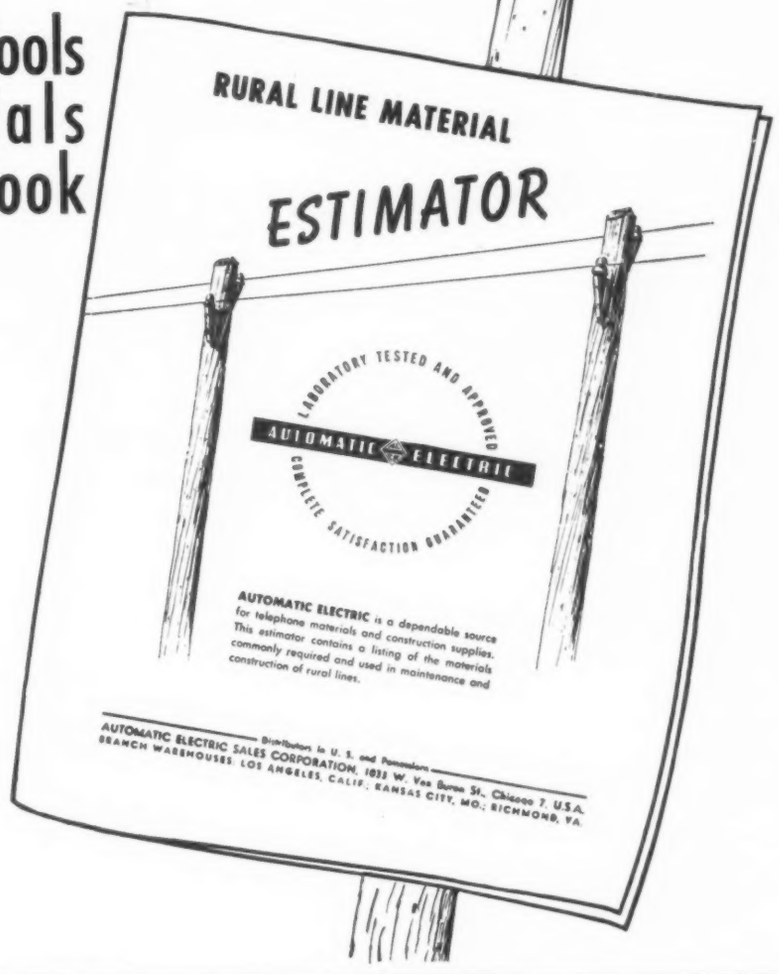
Distributors in U. S. and Possessions: Automatic Ele
Export Distributors: International Automatic
1033 West Van Buren Street, Chicago 7

ON

the Spring-tra la



Select Your Tools and Materials from this Book


RURAL LINE MATERIAL
ESTIMATOR
LABORATORY TESTED AND APPROVED
AUTOMATIC ELECTRIC
COMPLETE SATISFACTION GUARANTEED
AUTOMATIC ELECTRIC is a dependable source for telephone materials and construction supplies. This estimator contains a listing of the materials commonly required and used in maintenance and construction of rural lines.
AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., Chicago 7, U.S.A.
BRANCH WAREHOUSES: LOS ANGELES, CALIF.; KANSAS CITY, MO.; RICHMOND, VA.

a busy spring and summer for help you with your planning. ese two books today.

oo, for all the supplies you y products, made by famous et them *quickly* through the e nearest you.

e Your Order—

REPUBLIC 2-7175
3626 11th Avenue
Los Angeles 16, California

6-9280
2915 Moore Street
Richmond 21, Virginia

20

ri

ELECTRIC

owger Step-by-Step "Director" for Register-Machine Switching Automatic Dial Systems
Apparatus Electrical Engineers, Designers and Consultants

ns: Automatic Electric Sales Corporation
nal Automatic Electric Corporation
Street, Chicago 7, U. S. A.

AUTOMATIC ELECTRIC SALES CORPORATION
1033 West Van Buren St., Chicago 7, Ill.

Please send me copies of the booklets "How to Build and Maintain Farm Telephone Lines" and "Rural Line Estimator," without cost or obligation.

NAME_____

COMPANY_____

TOWN_____ STATE_____

a result of his numerous consultations with REA as the USITA small company committee chairman, he feels that the REA administrator and his staff are endeavoring to administer the act impartially and in a way to bring about a wide expansion of rural telephone service. He added, however, it was his opinion that it was too early to predict just how the government loan program would ultimately affect the telephone industry, as no set pattern of administration or policy in making loans had been established by REA as yet.

Mr. Henry was critical of some of the loan requirements which have been promulgated by the REA. He stated that the requirement calling for a first mortgage on a telephone company's property as security for a loan would prohibit many independent companies from participating in the loan program. He also said that the "area coverage" requirement must be clearly defined in each loan agreement as many companies could not meet the general and loosely defined requirements as set forth in the act itself.

Mr. Henry also expressed apprehension over the requirements giving REA the right to pass upon all expenditures and contracts and arrangements such as salaries, dividends, service and operating contracts and arrangements. He suggested that the exercise of this right by REA be limited so as to be applied only in case of default on REA loans or where, for some reason, the repayment of REA loans is seriously threatened.

He stated that he could not see how any progressive management could sign a loan agreement if security and other requirements are not clearly and definitely defined in each agreement.

He expressed the hope that the REA would consider these points in setting future policies.

Willard A. Jones, Washington, D. C., REA loan appraiser, in addressing the convention on "The REA Telephone Program," explained the provisions of the loan act and the requirements as established by the REA. He reported that, as of the time of the convention, the REA had received loan applications from 14 Iowa companies.

"Traffic Management in the Telephone Business" was the subject of an address by Stuart H. Kelley, Omaha, Neb., traffic operations supervisor, Northwestern Bell Telephone Co.

"Traffic management deals with many features of the telephone business, but mostly we deal with people —the splendid people who operate our switchboards so helpfully and so courteously that the whole United States

CLYDE McFARLIN, immediate past president of the Iowa Independent Telephone Association, gets some laughs from these Independent telephone women with one of his famous jokes.

looks to them as the watchword of the friendly voice. And finally there are the people we serve—the public of our nation whose calls we weave together to unite a hamlet or a village or a city or a nation into one composite society ready to exchange information about its markets and materials, its prices and provender, its hopes and fears, its despairs and delights," Mr. Kelley said.

This service to the public is brought about through the *completed call*— the only product the telephone industry has to sell. Mr. Kelley pointed out that all departments and all employes of a telephone company must do everything in their power to see that as many calls —both local and toll—are completed as is possible. In closing, Mr. Kelley paid tribute to operators, saying:

"Our primary product is the completed call and the operator is the moving force that produces the completed call. No place in the business is the individual more apt to become lost in the crowd, to feel that she is not an individual, that she does not belong and to lose sight of her important place in the business.

"The fact that the telephone service of this country is a beacon light to the world in charting the course to rapid, efficient, and unfailing communications service, delivered with unexcelled courtesy, is proof that we have measured up well to the challenge of our traffic responsibility of inspiring a multitude of people through all the years to work well and happily in getting the message through. It is our good fortune that our responsibility is never-ending and that tomorrow looks to a still more challenging adventure than did yesterday."

Don Ross, Des Moines, merchandising manager, *Successful Farming*, Meredith Publishing Co., in an address entitled "Is Your Slip Showing" warned that the telephone business and all other industries must let the public know what they are doing to improve the welfare and standard of living of the American people. He said most industries are doing a good job of "keeping their accomplishments secret."

Mr. Ross singled out the telephone industry as one of the greatest public service businesses, but still, he said, it is not doing a very good job of keeping the public informed as to its accomplishments. This is particularly true as far as the Independent segment of the industry is concerned, he stated.

"If the telephone business is to be kept out of the hands of socialized government, it must constantly tell the people that it is rendering the best and most telephone service and keep them informed of future plans to still improve and expand service," Mr. Ross declared.

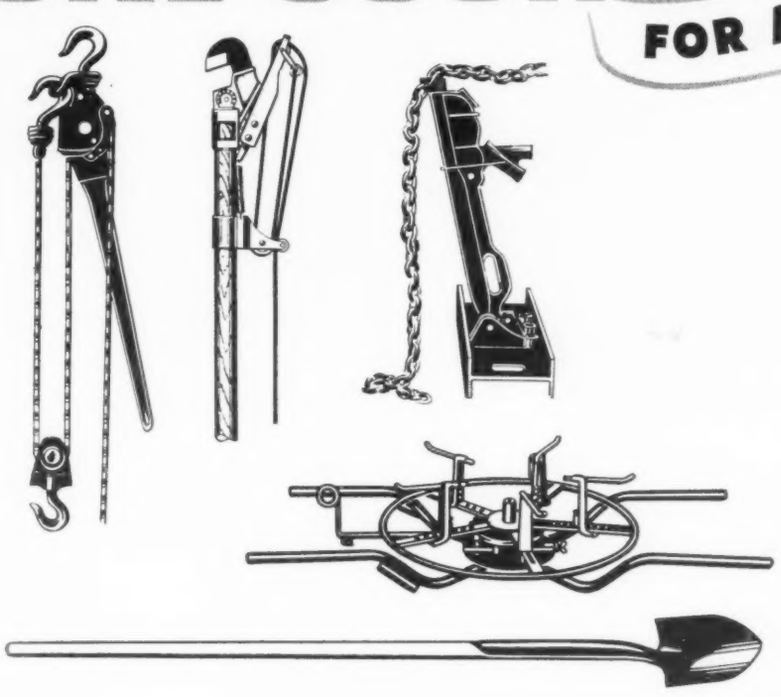
Mr. Ross stated that the public, which he termed "the boss," is growing more impatient at the failure of business in all lines to reestablish (since the war) the traditional American courteous and friendly treatment of customers and the time has come for a revaluation of this item by all business concerns, including telephone companies.

"While we are spending millions of dollars on new buildings and equipment, we had better consider spending some money to build and recapture the goodwill of the public," Mr. Ross recommended.

"Management should take a sincere and active interest in seeing that equipment in its traffic department is maintained in good working condition and in keeping traffic personnel currently informed as to company policies and problems," Mayme Workman, Springfield, Ill., traffic editor of Te-

(Please turn to page 64)

ONE SOURCE FOR ALL YOUR TOOLS



Why spend time shopping around for tools? From nearby Graybar you can fill all your requirements with just one order—and be sure you're getting dependable items. Graybar, pioneer supplier of tools and pole-line items to the independent telephone industry, has always selected only proven products of leading manufacturers who serve this industry.

Having all the right tools available when your linemen need them will increase job efficiency and avoid costly delays. Look over your tool inventory for shortages and antiquated or worn equipment—then check it against the following list of Graybar-distributed tools:

- blocks, snatch blocks, pulleys, jacks
- blowtorches, furnaces
- hoists, load binders, pole binders, tuggers
- ladders, rope
- line trucks, trailers, pole derricks, winches
- pole supports, pike poles
- peavies, cant hooks, carrying hooks
- pliers, screwdrivers, knives, wrenches, grips
- shovels, spoons, digging bars, tampers
- sleeve clamps and twisters, temporary guy clamps
- tool bags, belts, safety straps, tool pockets
- trimmers, lopping shears, saws
- wire reels
- hot-line tools: hinged universal tools, storm tools, insulated wire cutters, grounding sets
- safety equipment and first aid kits

EVERYTHING IN TELEPHONE SUPPLIES via Graybar

Your local Graybar Representative, as an employee-owner is anxious to make your order his personal responsibility—he'll see that you get prompt deliveries. In addition, the experience of a Graybar Telephone Specialist is always available to help you solve any unusual technical problems.

Besides pole-line supplies, Graybar can provide everything you need for wiring, ventilating, or lighting your buildings—plus "intercom" systems to speed your office work. *Graybar Electric Company, Inc. Executive offices: Graybar Building, New York 17, N. Y.* 5042

IN OVER 100 PRINCIPAL CITIES

POLES · CROSSARMS · INSULATORS · STRAND · CONNECTORS · HARDWARE · PROTECTIVE DEVICES · LINE TRUCKS · TOOLS

THE PLANT MAN'S *note book*

BY RAY BLAIN TECHNICAL EDITOR

A NEW type of telephone cable, developed by the Bell System, is known as LEPETH, which is not to be confused with ALPETH. "Alpeth" is an aluminum-polyethylene sheathed cable designed for exchange use.

This new cable is made with a .075 in. jacket of polyethylene extruded over the paper-wrapped core. The jacketed cable is then flooded with thermoplastic cement and over this a relatively thin lead sheathing is applied. Undoubtedly, the aim of the designers is to provide a better protection for the cable and at the same time save considerable lead over the amount used in the conventional type of lead sheathed cable. A test installation of some 16 miles has been installed on the coaxial cable route between Tucson and Phoenix, Ariz.

• • •

It has been said: "A conference is an organized way of postponing a decision."

• • •

There is certainly no good excuse for not soldering connections on communication lines these days. This formerly difficult job has been made very easy.

A chemically heated, cartridge iron proves convenient to use for this purpose out on the line in all kinds of weather. When the cartridge is inserted in the iron and struck by the firing rod, the temperature of the cartridge rises in 10 seconds to 862 degrees F., bringing the iron up to approximately 250 watts of heat energy. This maintains the tip of the iron at a constant soldering temperature for fully six minutes—more than enough time for the average soldering job.

• • •

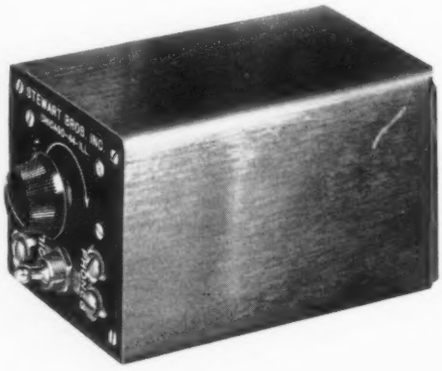
A new "vacuum-sintered" cemented carbide "twist-type" masonry drill claims two distinct features. These are: (1) an "angled" cutting point which practically eliminates motionless "dead center"—giving the drill greater biting power and full operating effectiveness and, (2) a faster spiral which cleans out dust at an accelerated rate.

These drills fit all standard rotary electric drills, and may be used successfully on all forms of masonry such as tile, slate, stone, marble, brick, limestone, glazed tile, plaster, asbestos, stone and other non-metallic construction materials.

Sizes are available from ¼ in. through one in., in increments of $\frac{1}{16}$ in.

• • •

The W. C. Dillon & Co. has recently announced a new exploring coil amplifier. This device is designed to amplify weak signal tones and will prove ideal for use with cable fault locators where



the signal strength must not be too strong or it will carry over the fault, but at the same time must be strong enough to be distinctly audible to the tester.

This amplifier may be used with any standard tone type cable tester regardless of its make or age.

• • •

According to a recent report of the International City Managers' Association, the telephone is replacing the manual fire alarm system. The report, which covers Pontiac, Mich., for the past five years, indicates that 88 per cent of the fires were reported by telephone. Furthermore, the telephone proved a more trustworthy reporter since only one per cent of the telephone alarms were false, compared to 56 per cent of those received through the alarm boxes.

• • •

A recent amusing editorial in the *Christian Science Monitor* is titled: "Millennium Telephonium," and states in part as follows."

"It's a long time since invention has produced anything as beneficial as the telephone. But now it has equaled that achievement. It has produced a gadget to stop people from talking on the telephone.

"If invention continues to catch up with itself this way, we may soon have the answer to the atom bomb—something to stop it from going off. Meanwhile let us be grateful for small blessings. We may not have banished war, but we are at least in for a little more peace, especially along the party lines.

"In one locality (we shall not say where because we don't want to start a housing shortage there) the telephone company is installing a sort of meter that will terminate the reciprocal transference of articulation—or, as the man who installs it says, will 'cut the gab'—to six minutes.

"This does not mean that the telephone will be less useful. It just means there will be less talk by more people instead of so much by so few. But it will also mean a limit to the lists of things that wives request husbands to 'pick up on the way home.' And what it will do to teen-agers is something for the anthropologists to contemplate."

While this device is not new to the telephone industry, it has not been used extensively in the past. The general feeling has been that the average telephone customer resents being disconnected regardless of a call's length. Perhaps with the present overloaded facilities in some localities, we will eventually be forced to use this timing device. It appears likely, however, that metered service and a doubling of the charge at three-minute intervals would prove more effective.

Maximum Economy!

Longer Service Life!

Higher Sustained Voltage!

CENTER TERMINAL IS POSITIVE
EVEREADY
COLUMBIA
TRADE-MARKS
GRAY LABEL
LONG LIFE
TELEPHONE CELL
This dry cell is the original telephone cell greatly improved and is built especially for telephone use. It delivers long service life with uniformity and dependability in the highest degree.
A
NATIONAL CARBON COMPANY
PRODUCT
MADE IN U.S.A.

For greater efficiency and maximum economy in operating rural, magneto telephone plants, use "Eveready", "Columbia", "Gray Label" telephone cells exclusively.

The terms "Eveready", "Columbia" and "Gray Label" are registered trade-marks of

NATIONAL CARBON DIVISION
UNION CARBIDE AND CARBON CORPORATION
30 East 42nd Street, New York 17, N. Y.
District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

a plan for TODAY

and TOMORROW!

The Bell System Companies' Benefit and Pension Plan does more than help provide for retirement. It also provides for emergencies that may occur during a telephone worker's career —Disability, Sickness, Accident, Death.

The advertisement on the opposite page, describing this well-rounded, soundly financed plan, appears in national magazines during April. It points out that such a program benefits not only the employees—but the public as well.

An advertisement of the

BELL TELEPHONE SYSTEM

"Their Pension Checks Come Regularly"

For more than 37 years, the working days and the future of Bell Telephone employees have been made more secure by a complete Benefit and Pension Plan. The Company pays the cost.

Long ago – before there was any thought of social security or of pensions by most companies – the Bell System Companies started a Benefit and Pension Plan for their employees.

The Plan is much more than a pension plan. It is a well-rounded, financially sound program to assist employees in meeting the emergencies of Sickness, Accident, Disability, and Death, as well as retirement.

It is designed to give help of different kinds and on different occasions when Bell System men and women – the younger as well as the older – may have need of it.

Plan Recently Improved – Important improvements have been made from time to time to meet changing conditions. Twice in the last four years the minimum pensions have been increased. Just last November the minimum pension was raised to $100 a month (including social security) at age 65 for employees with twenty years' service. Many employees get pensions of substantially more than $100 a month.

Benefits Public as Well as Employees – All of this is in the interest of the public as well as telephone employees. Because, for you to have good service, the Telephone Company must have good people to give it to you.

This Benefit and Pension Plan is part of the Bell Telephone Companies' responsibility as good employers and good citizens in every community in which they operate.

BELL TELEPHONE SYSTEM

PRACTICAL SUGGESTIONS FROM THE FIELD

Telephone men and women who have used new methods or devices to improve the operation of their companies are invited to share their ideas with others in this column. Publication will be after approval by three judges, and the contributors will be paid. Here's your chance to let fellow telephone people know about your company and to make the benefits of your progress industry-wide.

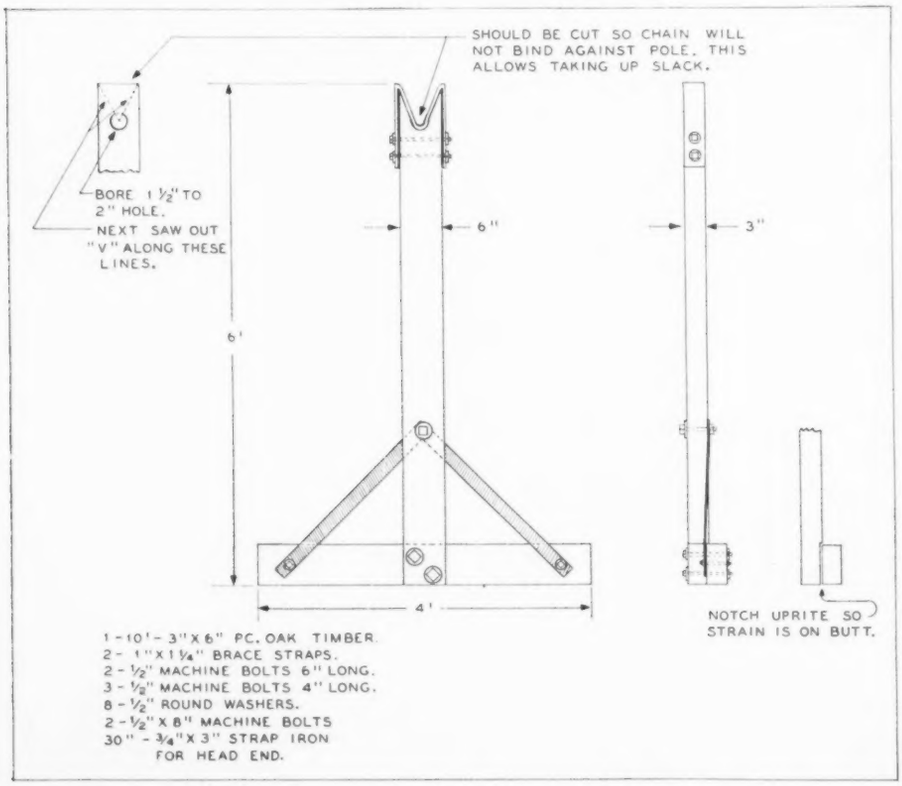
★ ★ ★

POLE JACK OF NEW DESIGN

Recently the Mid-Missouri Telephone Co., Gilliam, Mo., according to H. A. Jones, manager, was faced with the problem of dismantling about 22 miles of pole line. Being a small company, it was not fortunate in having a construction truck equipped with a winch and pole derrick which could be used to pull the poles. The conventional pole jack was ruled out as being too cumbersome and slow for a job of this magnitude.

It was noted that farmers often used broad rimmed wheels to remove fence posts and this idea was incorporated in the design of the power pole jack as shown in the accompanying drawing and photograph.

It was found that this device could


SHOULD BE CUT SO CHAIN WILL NOT BIND AGAINST POLE. THIS ALLOWS TAKING UP SLACK.
BORE 1 ½" TO 2" HOLE.
NEXT SAW OUT "V" ALONG THESE LINES.
6"
3"
6'
4'
NOTCH UPRITE SO STRAIN IS ON BUTT.
1 - 10' - 3" X 6" PC. OAK TIMBER.
2 - 1" X 1 ¼" BRACE STRAPS.
2 - ½" MACHINE BOLTS 6" LONG.
3 - ½" MACHINE BOLTS 4" LONG.
8 - ½" ROUND WASHERS.
2 - ½" X 8" MACHINE BOLTS
30" - ¾" X 3" STRAP IRON FOR HEAD END.

STROM

ANSONIA
Ankoseal

the modern, all-plastic, lightweight telephone cable . . .

saves three ways—

1. Lower first cost
2. Lower installed cost
3. Lower maintenance cost

Available for aerial, duct and direct burial use. For complete information contact your nearest Stromberg-Carlson Field Office.

THE ANSONIA ELECTRICAL COMPANY
Subsidiary of Noma Electric Corporation
Ansonia, Connecticut

STROMBERG-C

STROMBERG Telephone CARLSON

TELEPHONES, SWITCHBOARDS • SOUN

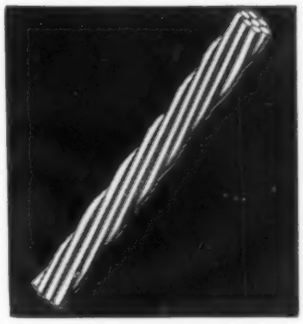
MBERG-CARLSON recommends...

crapo

guy and messenger galvanized strand

The superior tensile properties inherent in steel are used to full advantage in *Crapo* Galvanized Strand. The tightly adherent zinc coating applied by the *Crapo* Galvanizing Process provides lasting protection against corrosion, and prolongs the life of the strand. Controlled ductility makes *Crapo* Strand easy to work and to serve. Low first cost and low yearly cost result in important economies for operating companies.

The all-round dependability of *Crapo* Galvanized Steel Strand is being demonstrated constantly by its outstanding performance in service. There is a size and grade for all practical needs.

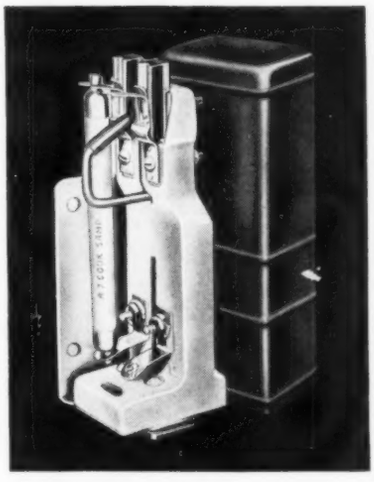


LONG LIFE—LOW COST

cook type 0 *sub-station protector*

This single circuit protector, equipped with fuses and lightning arresters, is unexcelled for either indoor or outdoor use. Special Cook-engineered features include:

1. Heavy white glazed porcelain designed to prevent surface leakage between current-carrying parts.
2. Tru-Gap high-potential dischargers that will not ground the line.
3. Phosphor bronze fuse and arrester springs, zinc hood, Everdur studs and washers. Hood is grounded when in place.
4. Choice of types and lengths of Cook Telephone Fuses.



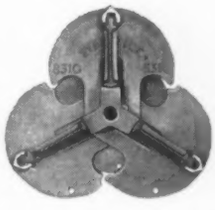
everstick anchors

. . . are designed to meet the most rigid anchoring and guying specifications.

The patented EVERSTICK Nut Housing locks anchor firmly on rod, making installation simple under all conditions and permitting easy recovery of the rod. Note well-designed, heavily constructed sections of metal in base plate.

EVERSTICK Expanding Plates are *ribbed* to double their original strength; their cutting edge and wedge shape arm socket reduces earth resistance to a minimum and assures easy expansion.

Three-Way EVERSTICK with expanding plates—contacts solid earth at every point around base plate, giving full benefit of earth's holding power.

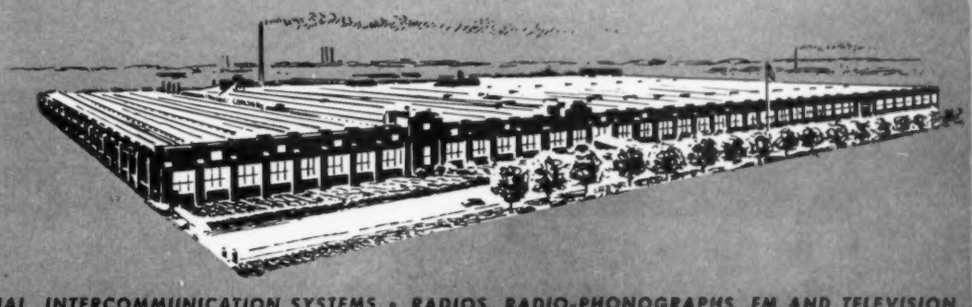


Spreader Arms extra heavy ribbed with ball and socket joint at top and clinched socket on expanding plates allow heavy bearings to move freely with minimum friction, insuring easy expansion which eliminates buckling or breaking of arms.

EVERSTICK Anchor

. . . the anchor of merit

RG-CARLSON



Factory, General Offices: Rochester 3, N.Y.
Branch Offices: Atlanta 3, Chicago 6, Kansas City 8, San Francisco 3. In Canada: Stromberg-Carlson Co. Ltd., Toronto

SOUND EQUIPMENT AND ELECTRONIC CARILLONS • INDUSTRIAL, INTERCOMMUNICATION SYSTEMS • RADIOS, RADIO-PHONOGRAPHS, FM AND TELEVISION

from every angle

there's a good reason for choosing the

CHANCE 8-STEEL-way Expanding Anchor

Here's what the men who buy and use them say: **Linemen**—"We don't have so much weight to carry."—"It takes fewer licks to expand."... **Foremen and Construction Superintendents**—"We do save some time and labor."—"There's no danger of breakage."—"We can tell when this anchor is expanded."... **Storekeepers**—"They're easy to handle."—"Your colored identification tag is a big help."... **Engineers**—"We can depend on the uniformity of steel."—"You've taken full advantage of all the area."—"Our tests show it has surprising strength."—"The cone shape is a good idea—you get a wedging action."... **Purchasing Agents**—"Any time we can satisfy ourselves on quality at a price we like—we're happy."... **Management**—"We've seen convincing proof that our lines are going to stay put with your 8-Way in the ground."...Whether you represent one or a combination of the men above—there's good reason for choosing the Chance 8-Way Expanding Anchor... You get more for your money.

Available for 6" and 8" Holes

You know it's RIGHT when you specify CHANCE

C 50-9C

A·B·CHANCE CO·

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

The jack in place and being used to pull a pole.

be used to pull the larger, 20 and 25-ft. poles, when powered with a one-half ton pickup truck. This truck was equipped with a special four-speed transmission.

This jack may be fabricated locally by any telephone company at a small cost.

Rural Telephone Program

(Concluded from page 18)

his farming so that neither he nor his livestock can get along without it. Consumption per power consumer continues to increase as he takes service for longer periods and this too is an important factor in the security of the system servicing him.

Telephones are different. On the one hand, as the use of telephones increases so do the operating costs in practically the same ratio. On the other hand, there appears to be more of a tendency to discontinue service in times of financial stress.

To arrive at the amount of equity we will require from the borrower, we weigh carefully a variety of factors that have a bearing on the loan security.

We hope to have qualified people inspect each existing property, talk to local leaders, and in general get first-hand information on which we can base a decision.

In closing I wish to make it plain that we in REA think it is our responsibility to help the widest practicable number of rural users obtain adequate telephone service in the most economical and efficient manner under a self-liquidating loan program. We will welcome any constructive suggestions which will enable us more effectively to discharge this responsibility.

Engineering Trends

(Continued from page 28)

several years. It is possible, perhaps, that this idea will be revived and developed some day to the point where it will prove economical though we feel inclined to doubt it. It appears that with the increased circuit requirement of late years in the average rural area, when buried plant proves desirable and economical, a tape armored cable of 25 pairs or more will prove out.

Much effort has been made from time to time to make use of power line carrier systems in the provision of good rural telephone service. This arrangement has proved entirely satisfactory and perhaps its only objectionable feature is its high cost. There is a probability that this cost could be reduced considerably if the required equipment could be placed in quantity production. The systems installed to date have, in general, been on a more or less experimental basis and the cost has, therefore, necessarily been rather high.

It would appear entirely possible to design a comparatively inexpensive carrier system to be superimposed on a single physical metallic circuit to provide 12 or more voice channels and furnish good telephone service at a reasonable cost. It is claimed that the Germans made use of such a system during the late war and that it operated successfully over almost any type of low grade physical circuit. It appears entirely feasible that such a system could be used to advantage to provide good rural telephone service and reduce the cost of physical plant to a minimum.

Further, during the late war, a carrier type of program system was designed and used successfully in some of our general hospitals. This system transmitted four different programs over one pair of wires. It would seem reasonable to assume that a somewhat similar system could be designed which could be used to advantage in the provision of a good grade of telephone service at a reasonable cost on certain types of rural lines.

In some localities, it might even prove desirable to install a small, pole-mounted, unattended dial exchange on the outskirts of the main exchange and make use of it to switch these carrier type rural channels. Physical trunk lines could be provided to connect this rural unattended dial system to the

CHANCE *Full-Rounded Thimbleye*

Gives EXTRA

guy strand protection

Only Chance and Chance-licensed Anchor Rods and Guying Fixtures have the *full-rounded* Thimbleye that gives extra guy strand protection. The perfectly shaped "thimble" extends all the way around the head of the rod to protect the cable from strain at any angle of pull, and to prevent kinking. (See Figure 1.) Sidewalls and groove are formed to fit snugly around the guy strand to keep it from flattening under tension. (See Figure 2.)

The Chance Thimbleye, Twineye, and Tripleye, for use with one, two, or three strands of cable are available in threaded or Nevercreep anchor rods. The complete line of Chance Guying Fixtures also features the full-rounded Thimbleye.

For greater line security, specify Chance Thimbleye Anchor Rods and Guying Fixtures. You can get them through your regular source of supply.

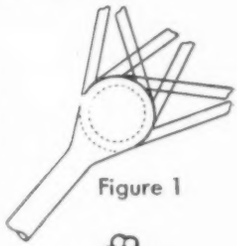


Figure 1

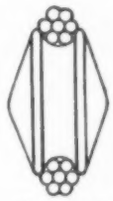


Figure 2

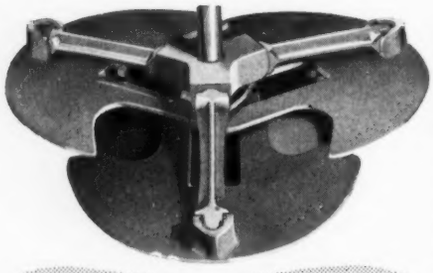
You know it's RIGHT when you specify CHANCE

A·B·CHANCE CO·

CENTRALIA, MISSOURI · SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

EXTRA HOLDING POWER
QUICK INSTALLATION
TOUGH FOR LONG LIFE

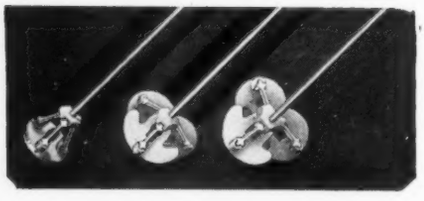


EVERSTICK ANCHORS

The preferred anchor of engineers and crews alike for permanent construction and maintenance work. Complete line of sizes to meet every guying problem. Made of tough, rust resistant malleable iron.

Special nut housing locks anchor firmly on rod and prevents rod from slipping through anchor.

QUICK INSTALLATION



Everstick plates are so designed to expand easily and quickly into undisturbed earth. The wide coverage of expanded anchor assures great holding power in any kind of soil. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

main exchange, and provide the required special operator service. By the adoption of this arrangement, the open wire physical circuits could be connected directly to the dial switching unit and the difficulty of extending the carrier channels through long runs of cable into the main exchange would be avoided.

The question is asked frequently why radio is not more extensively used to provide rural telephone service when it is so commonly used in taxi cabs, trucks and many private automobiles. Radio-telephone service has been used successfully in several isolated rural areas, however, the cost is high except in localities where the expense of providing wire facilities is also excessive or impossible. Another reason why radio-telephone probably can never be extensively used in the provision of rural telephone service is the difficulty of obtaining the necessary frequency allocations with the presently available equipment.

Politicians frequently claim that telephone companies in general have not made a proper and concerted effort to provide good telephone service to their rural customers. This accusation is considered most unfair since from the beginning of telephony, operating companies have made a supreme effort to furnish the very best telephone service available at the lowest possible cost to all who requested or desired it. Often this service was furnished at an actual loss by many telephone companies, when construction, maintenance and operating costs were all evaluated. As enumerated previously in this article, great sums of monies have been expended from time to time in an effort to provide rural plant at lower costs.

The comparison between the number of rural telephones and rural electric customers is not, in the opinion of the writer, compatible in any way. It is considered perfectly normal that more farmers should have electric service than telephone service. In the first place, in addition to good lighting, electricity makes possible many labor saving devices, such as washing machines, ironers, vacuum cleaners, feed grinders, etc. It also provides many recreational facilities such as radio, television, home movies, etc.

The telephone, while most desirable and useful in the event of sickness, accident or disaster, is more or less like insurance, not missed or appreciated until you need it. Naturally, the telephone cannot successfully compete with all the benefits that electricity can provide on the farm during times of depression. In these times, a small monthly saving may be realized by removing the telephone, but with several

RUNZEL CORDS

FOR *Every* TYPE INSTRUMENT

Finest workmanship in the trimming operation.

—

Highest grade materials.

—

Constant and varied inspections during the process of manufacture.

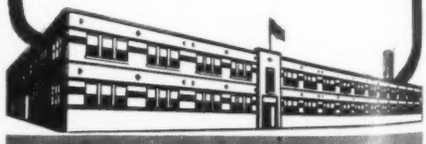
—

these features assure a consistent quality cord in every detail and are responsible for the clarity of reception for which RUNZEL CORDS are popularly known.

RUNZEL QUICK SERVICE

We carry large stocks of cords for all types of telephone service. Whether you need one cord —a dozen—or a quantity, you'll get prompt service on your order. Emergency requirements are given special attention.

You can RELY on RUNZEL



RUNZEL
Cord and Wire Co.
4723 W. MONTROSE AVE.
CHICAGO 41, ILL.

hundred dollars invested in electrical appliances, on the average farm, that will be made useless without electricity, every effort will be made to pay this bill and maintain a connection with the power line.

The complete story of rural telephone service would fill many large volumes and only a few of the high points have been touched very lightly in this article. It is hoped, however, that it may cause a bit of constructive thinking along proper channels and perhaps someday someone will come up with a good answer to this old and difficult problem—to furnish good rural telephone service at a rate the customer can afford to pay and which, at the same time, will provide a reasonable profit for the telephone operating company.

V V

Illinois Convention Traffic Conference

By MAYME WORKMAN
TELEPHONY's Traffic Editor

Traffic sessions of the Illinois convention were well attended. Thomas McGovern, Pekin, traffic superintendent, Middle States Telephone Co., presided.

R. A. Lumpkin, Mattoon, president, Illinois Consolidated Telephone Co., and a director of the Illinois association, extended greetings on behalf of the association and made some interesting comments.

Doris Mulligan, Bloomington, traveling supervisor, Illinois Telephone Co., presented the topic, "My New Illinois Friends And Our Plans For Coordinated Progress." Mrs. Mulligan, a newcomer in Illinois, stated she was glad to meet with Illinois traffic people and considered it an honor to have been invited to appear on the convention traffic program.

After giving a resumé of her company's plans for the future, the speaker stated: "I already feel that I have many new friends in Illinois and I am looking forward to meeting and talking with many more of you at this conference."

Ben B. Boynton, Springfield, general counsel of the Illinois association, who for over 25 years has addressed the general session of the conventions, addressed the traffic conference on the subject, "Service And Rates." Mr. Boynton pointed out that during the last five years a large number of telephone companies have had to apply to the regulatory commission for increases in rates and, in almost all cases where objectors appeared, the objections were not to the proposed rates but to the service, stating, "about

Koppers Full-Length Pressure-Creosoted Poles *retain* their strength . . . provide long periods of *uninterrupted* company service. Here's why:

1. All Koppers Poles must meet rigid standards as to the strength and soundness of the wood.
2. Fullest protection against decay is assured by scientific pressure-treatment with creosote *for the full length of the pole.*
3. Highly-experienced personnel supervise every step, from the procurement of the wood to the preservative process.

For poles that give you maximum service *in every way* and cut out night work, specify Koppers. Deliveries of Koppers Full-Length Pressure-Creosoted Poles are made promptly from many conveniently-located treating plants. Let us quote on your next requirements.

KOPPERS COMPANY, INC. PITTSBURGH 19, PA.

KOPPERS PRESSURE-CREOSOTED WOOD

WHY PUT UP WITH THIS?

WHEN YOU CAN HAVE THIS...

THE NEW KOILED KORD

FOR ONLY *75c*

Give your customers the finest, longest lasting, most convenient telephone cord without extra cost to them.

The new Koiled Kord uses tinsel conductors, rubber insulated to provide maximum flexibility and minimum pull. The jacket is neoprene to protect against moisture, grease, acids, oil, perspiration and other damaging materials. The neoprene jacket resists abrasion and the patented koil prevents kinking thereby eliminating two of the greatest enemies of old fashioned fabric cords.

Measuring only a little over 8 inches long, the new Koiled Kord has an O.D. of .195 inches and weighs less than 2¼ ounces. It has a pull of only 1 pound when extended to its full length of approximately four feet.

Koiled Kords available trimmed to fit all standard desk sets. Specify type when ordering through your Independent Telephone Supplier.

Koiled Kords
INCORPORATED

BOX K,
HAMDEN, CONNECTICUT

75 per cent of the complaints involved both plant and traffic."

"Good service, service with a smile," stated the speaker, "makes friends. If a person treats you shabbily you don't do any more business with him than you can help. If the reverse is true you enjoy the opportunity of doing business with him. Good service makes both friends and sells the service. It is much easier to regard telephone service as indispensable if the service is good."

Mr. Boynton's address contained a fund of valuable information for traffic people.

"Human Needs And Satisfactions" was the concluding and interesting subject discussed by Harry W. King, Springfield, traffic engineer, Illinois Commercial Telephone Co.

In his opening remarks, Mr. King stated: "In your community there is no group of people that has as many contacts with other people as you who are in the telephone business. No other group of people in American society has more reason to be interested in human relations or human needs than you who are in the telephone business."

In concluding his remarks, the speaker stated, "Over the years our operators and our supervisors have assimilated a vast amount of technical knowledge. Through practice and instruction they have developed a high degree of technical skill in the application of that knowledge. With respect to social knowledge and social skill the status is somewhat different."

"As telephone people at the supervisory level," Mr. King said, "we should probably first of all examine the kind of package that we wrap up and deliver to our job customers, our employes. After we have learned how to do that we should be in a better position to show them, our employes, how to wrap and deliver the package to our service customers."

"Service Objectives—the 'Big Four'," was the subject of an address by Thurley Barnwell, Chicago, training methods supervisor, Illinois Bell Telephone Co. She stated that "there are four items that make for prompt, accurate and pleasing telephone service." They are:

(1) Prompt answers to subscribers and other operators.

(2) Prompt and accurate completion without interruption.

(3) Unfailing courtesy, showing personal interest at each request or order.

(4) Immediate release of equipment for other calls.

"Improved public relations between our subscribers and ourselves will re-

your telephone is insurance, too

yes, and so is your

TELEPHONE ADVERTISING

A sound public relations and advertising program that honestly tells your subscribers what you are doing for them is just about the best piece of good will insurance you can buy.

For more than five years, the Telephone Advertising Institute has been furnishing hundreds of progressive Independent telephone companies with just that type of a *complete* advertising and public relations program — a program that has been acclaimed industry-wide as the finest ever offered the Independent telephone company.

This service covers every phase of public relations and advertising from colorful, beautifully produced posters to a ready-to-use news service.

Here is "big budget" quality—*but at a low cost even the smallest company can well afford.*

Write today for detailed information on this "good will" insurance—a program that gives you so very much value for so little money.

Telephone Advertising Institute

326 West Madison Street
Chicago 6, Illinois

sult if an all-out effort is made to achieve these objectives," Miss Barnwell said.

The speaker's closing thought was, "By the quality of the operator's service we are weighed in the customer's mind. If that service has been good, he is more receptive to rate increases; if the service has been poor, he is apt to be intolerant to change."

H. H. Butler, Clinton, general manager, Illinois Central Telephone Co., read "Prize Winning Letters" sent in by traffic employes from Illinois Independent exchanges.

The following were winners in the contest: *Tributary Group:* first, Beatrice Loser, Deer Creek Telephone Co.; second, Wanda Jamison, Ogden, Champaign County Telephone Co.; *Toll Center Group:* first, Katherine Gray, Olney, Illinois Commercial Telephone Co.; second, Dorothy Blizzard, Paris, Ill., Telephone Co.; *Supervisory Group:* first, Helen Hornbacker, Princeton, Illinois Central Telephone Co.; second, Agnes Coady, Taylorville, Illinois Consolidated Telephone Co.

Traffic people from 68 exchanges participated in the contest; 25 were from tributary exchanges, 15 from toll centers, and 28 supervisory people.

Beulah Curry, Tolons, supervisor, Champaign County Telephone Co., was the first speaker in the traffic session on the morning of Mar. 23. Her subject was, "CLR Is The Answer To Speedy Toll Service And Fast Operating." The speaker pointed out the many advantages in following the CLR method and related some favorable comments made by customers in her exchange after this practice was adopted. Some comments were: "This system is perfect. It gives me fast service"—"I wouldn't want to go back to the old method"—"I like to be kept on the line and hear what's going on" —"It's the best service we have had."

"666 Plan Discussion," resulting in group participation, was the concluding number in the traffic session. It was an interesting and instructive feature, resulting in the dissemination of a vast amount of helpful information. Irwin W. Steans, Springfield, Illinois Bell Telephone Co., was moderator. Panel experts were: Ray J. Alter, Galesburg; Goldie Dahlquist, DeKalb; Edwina Gorham, Mattoon; Anna Wilson, Chicago; Estherbelle McLennan, Dixon, and Mary Schmich, Freeport.

V V

Buys Oklahoma Company

Cecil Morgan Jr., has purchased the Sapulpa (Okla.) Telephone Co. from Luther D. Collins.

THE WHITNEY BLAKE BULLETIN

Published by GTE System

DROP WIRE ECONOMICS

THE ECONOMY OF HIGH QUALITY

The initial cost of drop wire is insignificant. Labor, overhead and miscellany can account for as much as 80% of the total installed cost. Thus, when so-called "low-cost" drop wire *fails,* its true cost becomes apparent — to the dismay of shortsighted drop wire economists.

Ordinary drop wire fails due to deterioration of insulation, or a lack of adhesion to the conductor. In TELEPRENE drop wire a special neoprene-compounded jacket, plus Whitney Blake's exclusive Teleplate process, provides the telephone operating company with *true* drop wire economy — a drop wire that resists weather so steadfastly and adheres so tenaciously that predictions as to its life-expectancy are nigh impossible. *Not a single case of TELEPRENE failure has been reported to date.*

The story of the research and effort behind TELEPRENE is an engrossing one. But most interesting to telephone people is the story of TELEPRENE's *performance, its economy* . . . For full information, write Whitney Blake *today.*

THE DIFFERENCE IN COST IS PENNIES

THE DIFFERENCE IN LIFE IS YEARS

Reprints of this advertisement are available on request.

WHITNEY BLAKE CO., NEW HAVEN, CONN.

Rural Line Construction

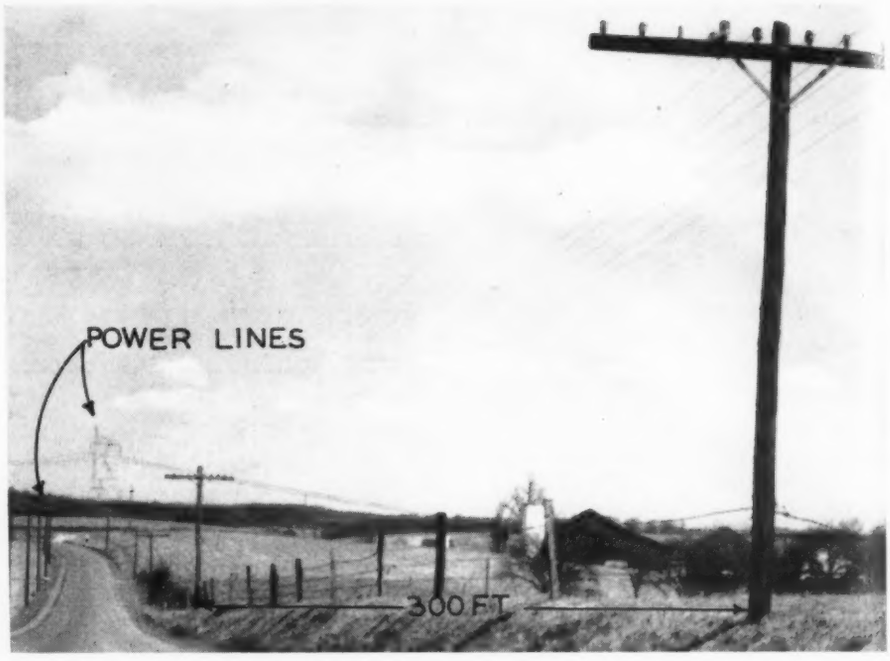
(Continued from page 22)

be heard when the coil and line cords are placed, as shown in *Fig. 8*, where the short is in the opposite direction from that shown by *Fig. 7*.

When there are two solid shorts on a line in opposite directions from the test location, a tone of equal intensity will be heard in each direction. When a solid short is in one direction and a high resistance short is in the opposite direction from a test location, as shown in *Fig. 9*, a louder tone will be heard in the direction of the solid trouble.

When testing to locate crosses, the crossed wires should first be identified by observing the lamp in the test set when the line cords are connected to the different wires in trouble and turning the generator crank. When the crossed wires are identified, proceed to make direction test, the same as for a short.

Opens may be located by connecting the line cords—one to each side of the line—and ringing. Either the operator or subscriber should answer, indicating in which direction the line is open. The direction of a ground either on one or both sides of the line may be determined in the following manner:



Long span rural main line lead with modern transpositions to eliminate power interference.

Fig. 10 shows a ground on line No. 1. A tone will be heard when the ground is in the direction shown, with the line cords of the set connected—one side to a ground and the other to line No. 1.

If the line cord clip "C" is moved in the opposite side of the tone coil and

Nicopress Sleeves

Make Better Special-Purpose Splices

Nicopress sleeves are available in 13 different combinations for electrical and mechanical splices including sleeves for spinning wire, dead end wire and other special applications. It's easy to make Nicopress special-purpose splices. Simply insert each end of wire in Nicopress sleeve and compress with handy Nicopress tool. You get a permanent tight splice that requires no further attention. Use Nicopress sleeves for all splices.

Recommended and Sold Through Our Distributors by

AUTOMATIC ELECTRIC

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

the tone is then heard, it is an indication that the fault is in the opposite direction. Line wire No. 2 may be tested for ground location in the same manner as wire No. 1. With the test set in the talking ringing position, a lamp will glow when there is a fault on the line in proportion to the resistance between the test set and the fault. Therefore, a fairly accurate estimate of the distance from test set to fault may be made in this manner.

The magneto test set may also be used for testing joints in line wire by placing the tone pick-up coil on the joint with one line cord connected to each side of the splice. When the generator crank is turned, the tone will be heard in the receiver if the joint has a high resistance. With the magneto test set and the volt-ohmmeter (multimeter), practically any case of trouble may be located quickly by the trouble shooter out on the line.

Protection for Exchange Circuits

(Continued from page 31)

but may hold over on higher voltages, thus causing a fire hazard. Where voltages higher than this may be encountered, 99A protectors may be used. The protector consists of three symmetrically arranged carbon cylinders separated by about .03 in. The nominal breakdown voltage of the gaps is 3,000 volts rms, 60-cycle. In use, the gaps are connected between each line conductor and ground. The purpose is twofold. First to provide a path to ground of high current carrying capacity to promote the positive and rapid deenergization of the power system and second to limit the voltage across telephone station protectors to a value that will prevent fuse holdover.

Fine Gauge Cable: Fuses as described above are, in general, now employed only at telephone subscriber stations and small private branch exchanges 24-gauge (or smaller gauge) lead or Alpeth cable is used instead of fuses. A length of this cable (six feet or more) is spliced in series with the entering cable between the protector frame and the point at which exposure to power circuit contact begins. This "protective cable" arrangement in lieu of fuses provides adequate protection for main frames and associated textile insulated tip cables, because the individual protector springs and tip cable conductors can safely carry currents up to the fusing point of 24-gauge cable. If the current exceeds this value, the 24-gauge (or finer) section will fuse and the resultant arcing within the cable will involve other conductors, thus distributing the current so that the current per conductor is within the capabilities of the office protector mountings and tip cables. This practice makes for substantial economies in main frame space and eliminates fuse maintenance.

Heat Coils: Where foreign voltages not high enough to operate protector blocks appear across them, the terminal equipment may provide the only path to ground for the resulting current. Such currents are termed "sneak currents" and although they are usually of small magnitude, in certain cases they may, if allowed to continue, overheat the equipment or associated wiring and constitute a fire hazard. It is the purpose of the heat coil to divert these currents before overheating occurs, by shorting the line to ground at the protector point. The heat coil now in general use in the telephone plant will carry 0.35 ampere for three hours and will operate on about 0.5 ampere in 3½ minutes.

No. 60-Type Fuses: These are devices having the same operating characteristics as the heat coil but when

your new talking points

Your voice has now grown to a tremendous new power since last July 1st when F.C.C. released radio channels for private industrial use.

Mobility makes a big difference in the industrial world. Now Motorola 2-way radio gives you a world of new talking points. Independence from land lines and huge savings in time and cost mean greater efficiency and profit for you.

That's what the new communications liaison can do right in your own operations.

Your new *talking points* will get more business done for you in less time!

A MOTOROLA system will bring you the utmost reliability and sure protection of your investment for many years to come.

BE UP-TO-DATE—Get FM 2-way Radio!

BE SURE—Get Motorola!

Specialists in mobile radio for twenty years, Motorola is the world's largest laboratory devoted exclusively to mobile radio communications.

FM 2-WAY RADIO

Motorola

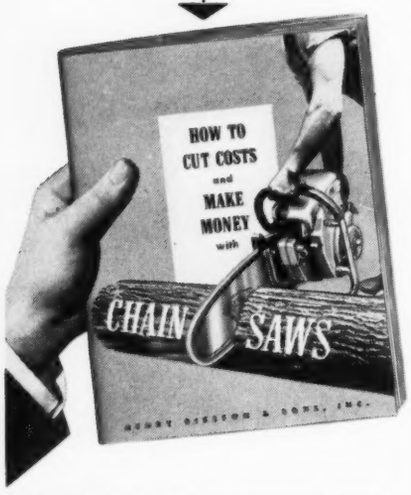
Only Motorola makes the "Handie-Talkie" Radiophone!

COMMUNICATIONS & ELECTRONICS • 4545 Augusta Blvd., Chicago 51 • in Canada: Rogers Majestic, Ltd., Toronto

COMPLETE RADIO COMMUNICATION SYSTEMS

DISSTON® CHAIN SAWS

can save you money



This BIG 36-page Book TELLS YOU HOW

...TO BUY

...TO USE

...TO PROFIT FROM CHAIN SAWS

IT'S FREE!

Send for your copy now. Simply fill in coupon and mail it today.

HENRY DISSTON & SONS, INC.

472 Tacony, Philadelphia 35, Pa., U. S. A.

In Canada, write: 2-20 Fraser Ave., Toronto 3, Ont.

ESTABLISHED 1840 — REG. U.S. PAT. OFF.

Henry Disston & Sons, Inc. (Adv. Dept.)
472 Tacony, Philadelphia 35, Pa., U.S.A.

Gentlemen:
I would like very much to have a free copy of your book "How To Cut Costs and Make Money with Chain Saws."

Name _____

Company _____

Street _____

City _____ State _____

My occupation is _____

_____

operated, *open* rather than *ground* the conductor. This fuse is used at locations where "sneak current" protection is necessary at places other than central offices, such as PBX locations.

Special Protective Apparatus

Apparatus of a special nature used in the telephone plant to minimize conductive or induced electrical effects, that may be produced by power systems, are listed below:

60-Cycle Static Drainage: Drainage units are used to reduce electrically induced fundamental frequency voltages to ground appearing on exposed open wire telephone circuits. The 104A and 108A protectors are provided for this purpose. The basic circuits for these are shown in *Fig. 3*.

Power Substation Protective Apparatus: Neutralizing transformers, three-winding transformers, for use on circuits serving power stations to neutralize the effects of ground potential rise are used when study indicates their need.

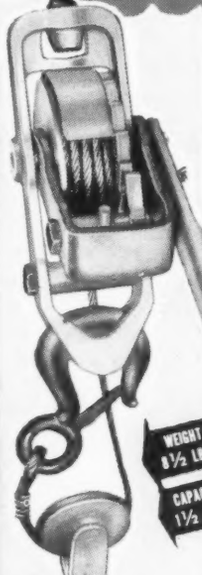
Low Frequency Induction Protective Apparatus: This apparatus is known as the short-circuiting relay protector, which is designed primarily for application to open-wire telephone lines exposed to low-frequency magnetic induction. In this device there is associated with the ordinary carbon protector blocks a relay whose contacts place a short circuit around the blocks within a very short time (about 0.025 second) after the initial discharge, thereby relieving the blocks of the duty of carrying the discharge current during a large part of the discharge interval. This reduces very greatly the chance of permanent grounding of the protector blocks with resulting service interruptions on the telephone circuits until the blocks could be replaced. The use of the multi-grounding type SCR protector increases somewhat the momentary interruptions on a line. Such interruptions, however, last only for the duration of the induced voltages. This is usually less than a second with the measures used by power companies to insure prompt deenergization of faulted sections of a power circuit.

The use of copper oxide varistors to prevent acoustic shock from receivers cannot be overlooked. Electrical surges often flow over lines to the receiver and a loud report is heard, often hurting the ear. The varistor shorts the receiver windings when disturbing voltages are encountered due to its characteristic functioning.

Protective Equipment Grounding Or Bonding

Protector blocks protecting cable are grounded or bonded to the sheath. This

LUG-ALL
All Purpose
WINCH-HOIST



WEIGHS ONLY 8½ LBS., YET LIFTS, PULLS OR LOWERS 1½ TONS DISTANCE OF 7½ FT., OR ¾TON DISTANCE OF 15 FT.

LUG-ALL has a built-in 'snatch block' and three swivel hooks for work around corners or in cramped quarters as close as 10½ inches. No brake to slip. 133 strand flexible aircraft cable. SAFETY HANDLE prevents accidental overload.

WEIGHT 8½ LBS.
CAPACITY 1½ TONS

AND IT COSTS ONLY
$29.50

LOWER FIRST COST
LOWER MAINTENANCE
COST... THAT'S LUG-ALL

LINCOLN PRECISION MACHINING CO.
NORTH GRAFTON, MASS.

TE

FOR
LACING CABLES
—and all other jobs needing a superior, all-flax cord.
A *Barbour* PRODUCT

THE LINEN THREAD CO., INC.
418 Grand St., Paterson 1, N. J.
NEW YORK 17
BOSTON 10 CHICAGO 10 SAN FRANCISCO 5
BALTIMORE 3 PHILADELPHIA 6 GLOUCESTER

For Telephone Troubleshooting . . .

No. 100 "Plastic Eye" Flashlight. PRE-FOCUSED.

GITS
"UNBREAKABLE" PLASTIC
FLASHLIGHTS

- 4 STYLES—One For Every Application!
- "UNBREAKABLE" PLASTIC PARTS—Shockproof!
- ALL BRASS CONTACT PARTS—Dependable!
- ECONOMICAL—Longer, Useful Service!

No. 122 "Super Right Angle" Flashlight. PRE-FOCUSED. Extra Bulb and Belt Clip.

No. 125 "Super Right Angle" Flashlight. DIFFUSED. Extra Bulb and Belt Clip.

To thousands of telephone maintenance men, GITS "UNBREAKABLE" PLASTIC (ETHYL CELLULOSE) FLASHLIGHTS have a reputation for years of rigorous, dependable service. Regardless of the weather or whether it's inside or outside, these flashlights **stand up on the job!** They won't rust or corrode. GITS FLASHLIGHTS are a "must" for performance and economy. Send for samples and prices on your letterhead — or consult your distributor.

No. 126 EXT. COMBINATION "Super Right Angle" Flashlight (PRE-FOCUSED) with Clamp-On Extension (DIFFUSED). Extra Bulb and Belt Clip. Used With or Without Extension.

Ask your Distributor or Write Direct

GITS *Molding Corporation*
4600 WEST HURON STREET
CHICAGO 44, ILLINOIS

"OFF-JOB TRAINING"
by HARRY C. WALKER, Ph.D.

Training Today Means Production Tomorrow

A New book for your job instructors.

Management, as well as each Department Head, Supervisor, Foreman, or Trainee realizes today the importance of proper and efficient job training.

- With a quarter century of practice and experience in job training, Dr. Walker treats the teacher and learner fully.
- Written in straightforward English, there is an abundance of practical suggestions for lesson planning, classroom procedures, training aids, and many worthwhile topics.
- Price $1.75 each including delivery.

ORDER FROM

TELEPHONY PUBLISHING CORPORATION
608 SOUTH DEARBORN STREET
CHICAGO 5, ILLINOIS

Longer Spans
350 FT.
150 FT.
Fewer Breaks
Lower Installation and Maintenance Costs
Better Transmission at Voice Frequency
. . . You get all these advantages with Amertel wire

SPANS OF 350 to 500 feet in length are possible with U·S·S Amertel-135 Wire. This means that in light loading areas approximately eleven poles can easily handle a line one mile long . . . only sixteen poles per mile are required in heavy loading areas. But with Standard B.B. wire, span lengths are limited to 150 feet in heavy loading areas, and 36 poles are necessary to handle a mile long line. *You save up to 20 poles per mile with Amertel!*

In addition to the savings in poles, Amertel effects great savings in accessory materials, in labor, and in installation and maintenance time. Amertel is long-lasting, too. It is hot-dip galvanized for maximum protection against corrosion. It has great resistance to vibration stresses . . . will stand up under heavy wind and ice loads.

Write for complete information on Amertel Wire and on our regular grades "B.B.," "E.B.B." and "Steel".

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Look for this tag.
It is your assurance of highest quality wire.

USS **AMERTEL**
TELEPHONE & TELEGRAPH WIRE
UNITED STATES STEEL

WHAT DO YOU PREFER for DROP WIRE?

Paragon, one of the earliest suppliers of drop wire to telephone companies, offers a complete selection of conductors—and each in either of two types of protection.

In ordering from Paragon you can pick your preference.

Paragon H. T. Bronze
No. 17 B&S gauge

A High Tensile B.B. Bronze with rated 80% conductivity. It is very strong—with a rating of 90,300 P.S.I. minimum. A strong serviceable drop wire — available in twisted or parallel pair in Paraprene or Weatherproof braid protection.

Paragon Copperweld
No. 18 B&S gauge

One of the most popular conductors because of its strength and workability. Conductivity rating is 30%. Strength rating 133,000 P.S.I. minimum. Available in twisted or parallel pair in both Paraprene or Weatherproof braid protection.

Genuine IRONITE
18 or 19 B.W.G. gauge

The old popular iron conductor — protected by modern "Flozinc" process, plating. Offers strength, conductivity and workability with economy in cost. Available in twisted or parallel pair in Weatherproof braid protection.

The life of a drop wire depends largely on the weather protection. All Paragon "drops" are offered in either—

Paraprene Insulation

A specially processed rubber insulation that really adheres (sticks to) the conductor—encased in a seamless sheath of Faraprene. This is tough, weather and wind resistant. Not affected by heat, cold, alkali wind, moist salt fogs, oil, acid, etc. A most satisfactory insulation.

Weatherproof Braid Insulation

The same specially processed rubber with high adhesion to the conductor, is encased in a woven braid of long staple cotton and mineral fibers that are tough and weather resistant. Impregnated and finished with hot stearine pitch and powdered mica, this insulation (U.R.C. Spec.) resists hot dry wind or damp salt fog, heat, cold, etc.
The old dependable insulation — much improved.

All Paragon Drop Wire is packed in approx. 1000 ft. coils in heavy individual cartons.

Paragon also offers a complete line of Interior, Duct, Jumper, Ground and Tree Wire available for prompt shipment.

PROMPT SHIPMENTS from CENTRALLY located factory— SYCAMORE, Ill.

Write for samples and prices.

Ask for Bulletin

Telephone Division

PARAGON ELECTRIC CO.

TWO RIVERS **WISCONSIN**

is accomplished by clamping the ground wire to the strand and depending upon the spinner wire for bonding or if the cable is in rings a bonding strap is placed. On extra long cables it might be wise to provide other good ground such as a water system or a power multigrounded neutral system in *addition* to the sheath ground. It is important to protect *all* circuits including those only using drop wire where line wire is fed from cables in lightning areas.

Bonding two cables together that are using the same poles is important to prevent differences of potential between them. Where differences of ground potential are expected at station grounds between power grounds and the telephone grounds, it is good to consider bonding the two together.

If no problem arises from electrolysis it is a good practice to omit strain insulators in down guys if they can be effectively grounded to insure prompt deenergization in case power wires contact them (this is a complex problem and further study should be made before the insulators are omitted).

Most protective devices require good grounds. Underground cables, cable sheaths connected to central office grounds, water systems and the pole grounds on power systems bonded to a multigrounded neutral are considered good grounds.

Wires used for grounding and bonding must be capable of carrying the expected currents.

Where Protection Is Not Required

Unexposed stations and cables require no protection. This means that they are exposed to 250 volts or less.

Application of Protective Devices

See *Fig. 4* for the most general application of the common protective devices.

Conclusion

There has been much development in protection devices in the last few years and we can expect further changes as power and telephone industry develops. Our devices will have to be changed and improved to meet new needs.

(The foregoing is an address presented at the plant conference at the recent Texas convention.)

V V

>> The more a 21-year-old Minneapolis man drank, the sorrier he felt about the $100 he had stolen. Finally he telephoned his victim to apologize. While the robbed man talked, his wife went next door to trace the call. Two police nabbed the thief—still talking and sorrier than ever.

We Make More

Different

Better

Reasonably Priced

TELEPHONE DIRECTORIES

than any other printer

R. R. Donnelley & Sons Company

350 E. 22nd St., Chicago

Haleys

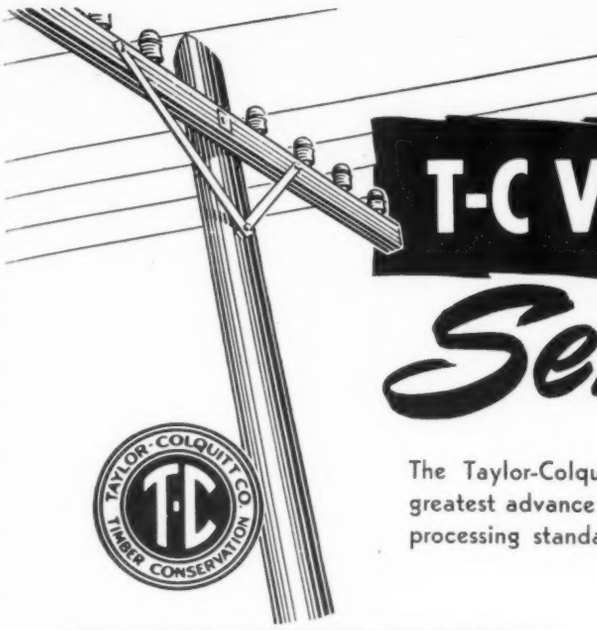
CEDAR POLES
FIR CROSS ARMS

Quick Truck Shipments from our Ohio yard

●

Also yards at Minneapolis and Haley, Idaho

R. G. HALEY & CO., Inc.
SPITZER BLDG.
TOLEDO 4, OHIO

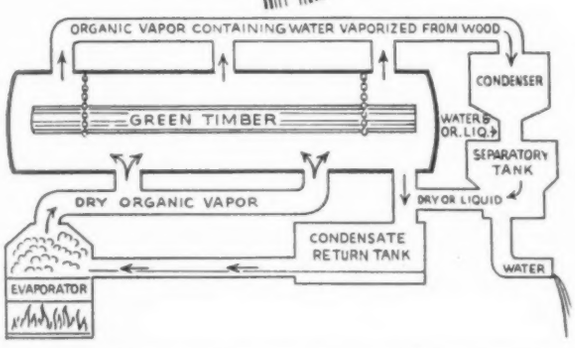


T-C VAPOR-DRIED POLES

Serve Longer!

The Taylor-Colquitt Vapor Drying technique for processing poles marks the greatest advance in pole preserving methods since the establishment of modern processing standards. Here are four important things Vapor Drying does:

1. Retains the original tensile strength of green poles, increasing the breaking resistance by 20 per cent over that of steam dried poles.
2. Permits deeper penetration and more uniform distribution of the preservative.
3. Weights of vapor dried, treated poles are approximately four pounds per cubic foot of wood less than green steam seasoned poles.
4. Eliminates bleeding by retaining a higher percentage of the preservative deeper in the sapwood of poles.

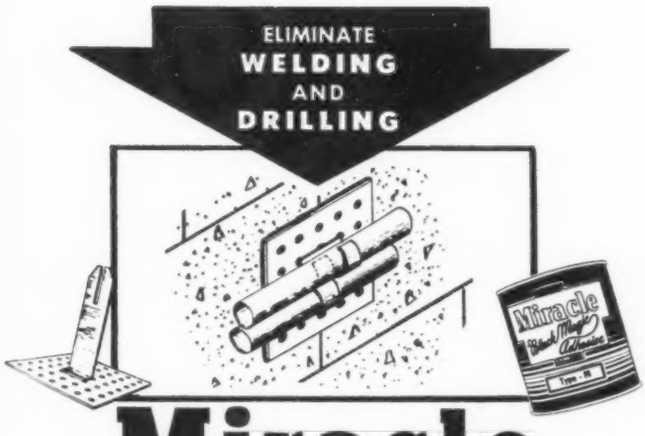


Recommended and Sold Through Our Distributors

AUTOMATIC ELECTRIC

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

ELIMINATE **WELDING** AND **DRILLING**



WITH **Miracle**

SURFACE ANCHORS AND ADHESIVES

Use Miracle Surface Anchors Bonded with Miracle Adhesives to support wires, cables and light weight pipes to masonry, steel or any rigid surface—Quickly and Permanently—Mechanical anchorage no longer necessary!

Check these advantages of Miracle "CONSTRUCTION by ADHESION!"

- Cleaner—No Muss or Fuss
- Safer and Superior
- Goggles Not Needed
- No Electric Cords or Attachments
- Less Fatigue to Workman
- No Noise
- No Inconvenience to Occupants
- Saves Labor and Tool Expense

FREE: Interesting, colorful brochure on "miracle surface anchors"! Write for your copy today.

MIRACLE ADHESIVES CORP.
214 E. 53rd St., New York 22
For anchors write
DEVICES, INC.
214 E. 53rd St., New York 22
Dept. T-422

It's the **TORNADO***

Pac-Vac

For Quick, Safe CLEANING of Switchboard Interiors and Associated Equipment

Slung over the shoulder to leave both hands free for easy, maneuverable operation in cramped, confined areas. Quickly and safely draws out all dust and dirt, and deposits it in a compact, dust-tight bag. Powerful suction instantly removes every trace of foreign matter from relays assuring perfect contact. Attachment brushes and nozzles are non-conductive; jacketed with a thick layer of natural rubber. The safest, surest, easiest way of keeping switching equipment in perfect working condition. Light in weight. Easily carried and handled.

Converts to powerful, portable blower. Shoots a concentrated stream of **dry** air into hard-to-reach places to remove long-standing accumulations of dirt. Cleans instantly and thoroughly. Safe for the most intricate equipment.

Bulletin *579* contains complete information. Ask for it.

*Trade Mark Reg. U. S. Pat. Off.

BREUER ELECTRIC MFG. CO.
5096 Ravenswood Avenue • Chicago 40, Illinois

Insto-Gas
T. M. REG. U. S. PAT. OFF.

FURNACE
For Cable Splicers

Melts 40 pounds of metal in six minutes

•

Operates in all kinds of weather

•

Lights Instantly — Won't Blow Out

Also available in floor type furnace—With 50 ft. hose can be operated on splicing platform

INSTO-GAS TORCHES

These instant lighting torches are made in five sizes for all kinds of flame soldering and finishing splices.

•

Listed by both Underwriters and Factory Mutuals Laboratories.

Write today for complete information or use coupon.

Send information on Insto-Gas to

NAME _____

ADDRESS _____

Insto-Gas Corporation • Detroit 7, Mich.

Iowans' Small Company Plan

(Concluded from page 44)

LEPHONY, and executive secretary of the Independent Telephone Pioneer Association, told the convention. The subject of her address was "Your Traffic Department Speaks."

Operators have built a reputation for courteous, friendly and speedy communications service to the public until they are recognized as a "symbol of the American spirit of service and helpfulness," and management should be interested in doing everything in its power to see that this traditional service is maintained, she said.

This can be accomplished to a great extent, Mrs. Workman stated, by management, in making periodical visits to operating rooms to inspect equipment and through personal consultations with operators and traffic supervisors.

The last afternoon of the convention was given over to a panel discussion of various problems and matters of current interest. Taking part in the panel were:

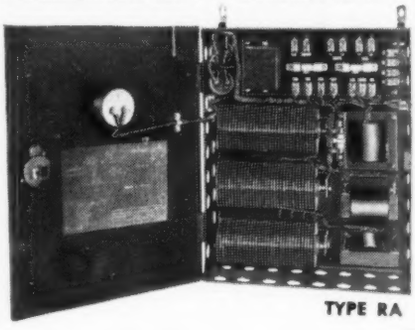
C. C. Pearce, manager, Farmers' Telephone Co., Riceville, Iowa, moderator; George Charlesworth, electrical engineer, Iowa State Commerce Commission; H. B. Couch, secretary, Kansas Telephone Association; Claude Coykendall, executive secretary, Iowa Good Roads Association; Kenneth L. Dally, vice president, Central Telephone Co., Sioux Falls, S. D.; Margaret Grace, traffic chief, Ft. Dodge Telephone Co., and Carleton Haven, district manager, Iowa Continental Telephone Co., Rockwell City, Iowa.

Traffic and plant conferences were held during the convention. Mrs. Workman was in charge of the traffic meeting and Ray E. Elliott, Des Moines, assistant plant employment supervisor, Northwestern Bell Telephone Co., directed the plant conference.

Directors re-elected at the convention are: Howard C. Amick, Des Moines; Roy E. Brandel, Mt. Pleasant; E. L. Hons, Paullina; H. J. Hopkins, Jesup; Clyde McFarlin, Montezuma; H. B. Melick, West Liberty, and C. C. Pearce, Riceville. Sutherland Dows, Cedar Rapids, was elected a director to fill the unexpired term of J. P. Walters, deceased.

Officers elected by the directors are: President, Earle G. Bellamy, Knoxville; vice presidents, Mr. Pearce and Mr. Brandel, and secretary-treasurer, W. F. Miller, Des Moines.

Dependable
DC POWER SUPPLY
for Lamp Signal and Automatic Switchboards
LOW IN FIRST COST!
LOW IN OPERATING COST!
ELECTROX
CONSTANT VOLTAGE BATTERY ELIMINATORS



TYPE RA

MANUFACTURED to the exacting standards of the telephone industry, the Type RA ELECTROX Constant Voltage Battery Eliminator will deliver direct current of suitable smoothness for operating lamp signal and automatic switchboards without the use of batteries.

The Type RA ELECTROX delivers a practically constant output voltage irrespective of current drain up to the maximum output of the rectifier. Constant voltage output is obtained automatically — requires no manual adjustments.

Housed in a ventilated steel wall mount cabinet, the Type RA ELECTROX eliminator requires no attention or maintenance. Simply plug it into your AC power supply and forget it. Available in numerous capacities to supply required DC voltage, with or without power-off relay.

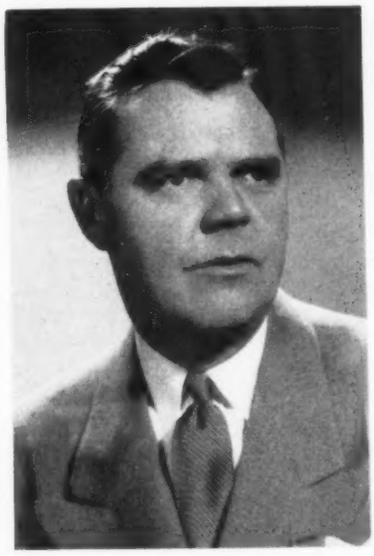
For complete information on the Type RA and other ELECTROX eliminators for the telephone industry, write for Bulletin 1462, or see your Jobber.

RECTIFIER DIVISION
The SCHAUER MANUFACTURING CORP.
2057 Reading Road, Cincinnati 2, Ohio

General Announces Further Changes in Subsidiaries

Several other subsidiaries of General Telephone Corp. elected new officers and directors recently (TELEPHONY, Apr. 1, p. 40).

At a meeting in Madison, Wis., on Mar. 27, T. Holden Moran was elected president of Commonwealth Telephone Co. to succeed Burton W. Saunders. Mr. Saunders will continue as president of Illinois Commercial Telephone Co. and as director of Commonwealth.



T. H. MORAN

On the same day, L. H. Meyer was elected president of Central Vermont Telephone Corp. and on the following day he was named president of Upstate Telephone Corp. of New York and Tri-State Associated Telephone Corp.

L. H. MEYER

All three offices had been vacant since last November. He was formerly vice president and general manager of all three companies.

At meetings held in Lexington, Ky., on Mar. 29, Harry J. Huether, Jr., was elected president and appointed general

NEW SOURCE OF INCOME

YOUR SUBSCRIBERS NEED THEM

Wheelock CODE CALL FOR INSTANT COMMUNICATION

Improve your subscribers' service by installing Wheelock Code Call Systems in plants, stores and offices on a *rental basis*. Don't miss this source of big potential income. Let us explain the facts. Write for Bulletin B-44 which describes how code call is made by a numerical code, sounding signals; with full information about features and advantages.

Sales Representatives in Principal Cities

Also: SIGNALS RELAYS FIRE ALARM

Wheelock CODE CALL SIGNAL
ENGINEERING & MFG. CO.
154 WEST 14TH ST., NEW YORK 11, N.Y.

COLEMAN Converted MAINTENANCE Trucks go "Anywhere"

Use Any Standard Truck with COLEMAN for Your 4-Wheel Drive

Here's a Coleman-Converted Chevrolet that "goes where other trucks can't" . . . for off-the-road repairs and construction. This standard Chevrolet truck with telephone maintenance body has been converted to heavy duty 4-wheel drive power with Coleman Front Wheel Drive.

Coleman Front Wheel Drives are easily serviced—no special tools or skills required. Can be easily installed on Fords, Chevrolets, GMC's, Internationals, and Dodges. Write for full information today!

Check These COLEMAN Features!

- Steering Pivot Over Vertical Center of Tire
- Locking Center Differential or Transfer Case Available
- Underdrive — Proper Speed for Every Job
- Standard Parts Make Repairs Easy
- Maintained with your present service department

The American-Coleman Company
OMAHA, NEBRASKA

IF YOU WANT THE MOST FOR YOUR MONEY—

SAY HELLO TO "UTILITY'S"

"JUNIOR BODY" SERIES

and

CUT DOWN OPERATIONAL COSTS!

Convert your Pick-up truck *NOW* into an efficient Service body. By adding a set of "JB's" to your truck—you can get the job done *FASTER, BETTER,* and *MORE ECONOMICALLY!*

Four models to choose from: JB-1 10"x13", JB-2 13"x16", JB-3 10"x20" JB-4 13"x20". Available in *any desired length* to *CORRECTLY FIT* your truck body regardless of age, make or model!

● Rugged all-steel construction ● piano hinge full length on all doors ● compartments weather-proof under any climatic conditions ● convenient sectional lay-out, handy tray section with adjustable spacers ● complete easy-to-follow mounting instructions, 3 outside material hooks, mounting brackets, and all necessary bolts, nuts, etc. supplied with each order ● prime-painted outside, lasting silver aluminum finish inside ● low freight shipping rate ● also ideal body additions for platform & flatbed bodies. . . .

Sturdy CR steel-tubing ladder carrier and finish painting optional.

Write factory for information on full line of larger bodies, Pole derricks, Winches, Pole & general purpose trailers, and all other associated equipment.

UTILITY TOOL AND BODY COMPANY
CLINTONVILLE, WISCONSIN
BUILDERS OF DEPENDABLE EQUIPMENT SINCE 1935

ESTWING BLADES *Cut Keen!*

ONE-PIECE STEEL HEAD
LAMINATED LEATHER
HANDLES OVER H-BEAM
STEEL CORES

Estwing hatchet blades are keen-cutting, hold their edge longer. Handles are cushioned for greater comfort. Built up with laminations of new, live leather over H-Beam steel cores, Estwing handles absorb the shocks, permit full use of the finely tempered steel heads. Specify Estwing hatchets and other Estwing hand tools the next time you order line equipment. You'll save, because Estwing tools are longer lasting.

RECOMMENDED AND SOLD THROUGH OUR DISTRIBUTORS

AUTOMATIC ELECTRIC

Distributors in U. S. and Possessions: Automatic Electric Sales Corporation
Export Distributors: International Automatic Electric Corporation
1033 West Van Buren Street, Chicago 7, U. S. A.

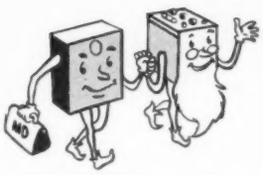
H. J. HUETHER, JR.

manager of Lexington Telephone Co. and Ashland Home Telephone Co., effective Apr. 1. The posts of president of these two companies had been vacant since L. F. Shepherd resigned on Mar. 1 to become president of Pennsylvania Telephone Corp.

L. O. Evenson, who has been vice president and general manager of the Lexington and Ashland companies, resigned, effective Apr. 1, to become vice president of Southwestern Associated Telephone Co., Dallas, Tex., fourth largest company in the General system. Ralph D. Heusel, formerly general auditor of the Kentucky companies, was elected vice president and a director of both. Recently he was elected vice president and a director of Indiana Associated Telephone Corp. and Michigan Associated Telephone Co. He will be succeeded as general auditor of all four companies by Frank A. Peter.

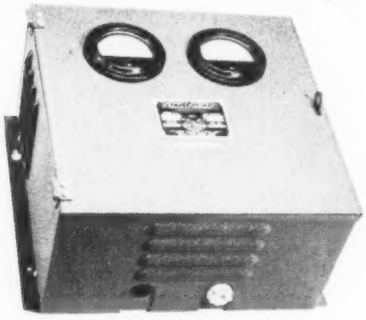
I. F. KREHBIEL

At a directors' meeting in Spokane, Wash., on Mar. 30, I. F. Krehbiel was



PROLONG BATTERY LIFE

Prevent Over and Under Charging



RAYTHEON

RECTICHARGER*

Maintains Constant (1% plus or minus) Output

Follows the Load Automatically

Compensates for Wide Input Changes

Self-Protecting on Overloads

Completely Automatic No Moving Parts

Your telephone-equipment supplier has models to suit every need.

Write for complete information

*Reg. U. S. Pat. Of

RAYTHEON MANUFACTURING CO.

Magnetic Components Division

DEPT. 6460-T

Waltham 54, Massachusetts

RAYTHEON

Excellence in Electronics

Sales Offices:

ATLANTA DETROIT
BOSTON NEW YORK
CHICAGO SAN FRANCISCO
CLEVELAND SEATTLE
WASHINGTON, D. C.

elected president of Interstate Telephone Co. Mr. Krehbiel, who had been vice president and general manager since 1948, succeeds C. E. Johnston, who was named chairman of the board.

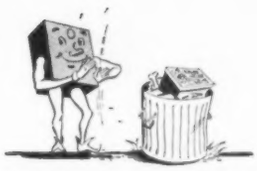
Mr. Moran, who was elected president of Commonwealth Telephone Co., has been with the General Telephone System 22 years, having started in 1928 as a clerk for that company. Following four years of service with the Army, he was appointed secretary and treasurer of Indiana Associated and in January, 1949, returned to Commonwealth as vice president and general manager.

Mr. Meyer, who was elected president of the New York and Vermont subsidiaries, has been with the system 23 years and before that was associated with New York State Gas & Electric Corp. He started his telephone career in 1927 as auditor of Black River Telephone Co., which is now part of Upstate Telephone Corp. In 1932 he was made general manager of Upstate.

Mr. Huether, who was elected president of the Kentucky companies, started in the telephone business in 1923 as an operating engineer's assistant with the Bell Telephone Co. of Pennsylvania. From 1929 to 1935 he served with the Pennsylvania Public Utility Commission as telephone engineer. He has been associated with General Telephone System since 1935, when he joined Pennsylvania Telephone Corp. as group commercial superintendent. In 1943, he became vice president and general manager of Ohio Associated Telephone Co. and in 1946 vice president of General Telephone Directory Co. More recently he has been general commercial superintendent of the Indiana, Michigan and Kentucky companies.

Mr. Evenson has been vice president and general manager of Lexington Telephone Co. since 1944 and of the Ashland company since its acquisition by General in 1946. Prior to going to Lexington he served as general commercial superintendent of the system's properties in Michigan, Indiana, Wisconsin, Illinois and Kentucky. He joined the system in 1930 as an accountant with Commonwealth Telephone Co.

Mr. Krehbiel has been in the telephone business since 1921, when he joined the United Telephone Co. in Abilene, Kan. In 1937 he became associated with General Telephone System as a member of the sales department of General Telephone Directory Co. He was appointed commercial superintendent of Interstate Telephone Co. in 1939.



ELIMINATES BATTERIES

RAYTHEON

RECTIFILTER*

Stabilizes Voltage

Minimizes Power Costs

Eliminates Frequent Inspection and Service

Releases wires carrying charging current for revenue producing service.

Available through your regular telephone-equipment supplier in a wide range of sizes, with provision, where required, for switching to an emergency DC source.

Write for complete information

*Reg. U. S. Pat. Off.

RAYTHEON MANUFACTURING CO.

Magnetic Components Division

DEPT. 6460-T

Waltham 54, Massachusetts

RAYTHEON

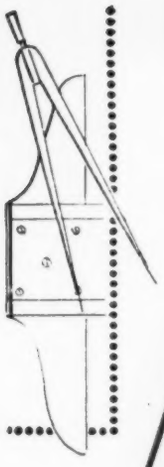
Excellence in Electronics

Sales Offices:

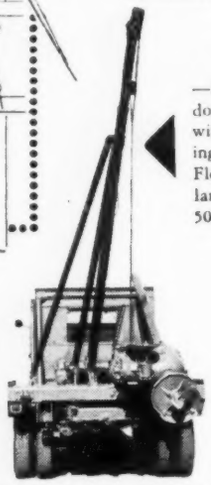
ATLANTA DETROIT
BOSTON NEW YORK
CHICAGO SAN FRANCISCO
CLEVELAND SEATTLE
WASHINGTON, D. C.

Designed to meet your needs...
PRECISION BUILT
POLE DERRICKS

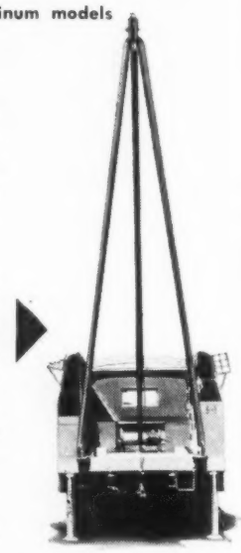
Available in both steel and light weight aluminum models



T-TYPE POLE DERRICK
—handles wide range of work. Operates with double drum winch. Derrick head equipped with special cable guide rollers to avoid fraying or shearing cable —increases cable life. Flexible — adapted to trucks 1½ tons and larger. Lift — approx. 22 ft.; handles poles 50 to 55 ft. length.



TRIPOD TYPE DERRICKS
—handle wide range of lifts with ease and rigidity. Telescoping side-legs available for all models at slight extra cost. Derrick head equipped with roller guides for cable protection and long cable service life. Available in 4 models: handling poles 35 to 70 ft. lifting capacity up to 13,000 lbs. with stiff-leg in ground position.

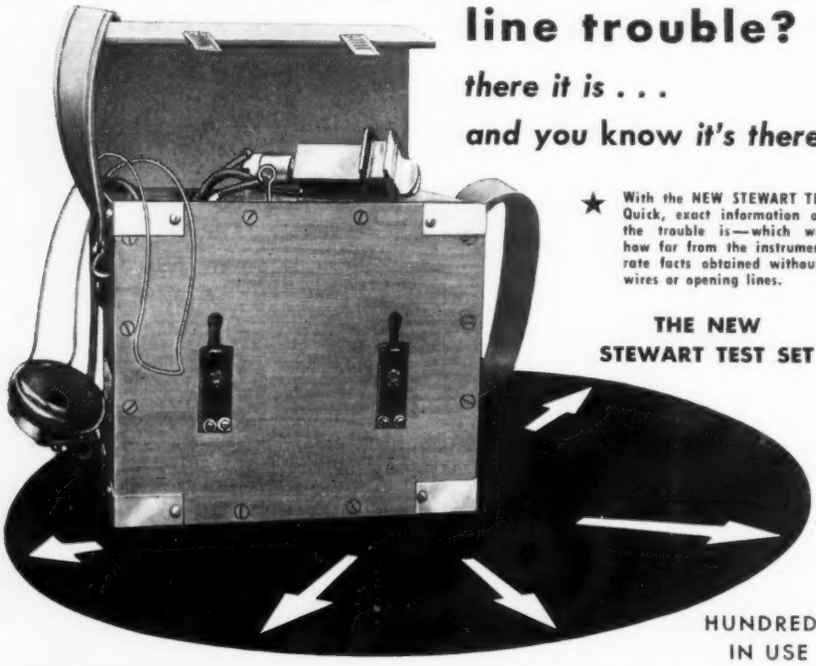


FWD pole derricks are precision built to provide the utmost in safety and service. For complete information on derricks and other FWD line construction and maintenance equipment send for catalog.

EAGLE MANUFACTURING CO.
Division of the Four Wheel Drive Auto Co.
APPLETON
WISCONSIN

Distributed by Graybar

Write today for the complete catalog of FWD Line Construction and Maintenance Equipment — a useful reference book.



line trouble?
there it is . . .
and you know it's there!

★ With the NEW STEWART TEST SET. Quick, exact information on where the trouble is—which way—and how far from the instrument. Accurate facts obtained without cutting wires or opening lines.

THE NEW STEWART TEST SET

HUNDREDS IN USE

The NEW STEWART TEST SET is handy, convenient to work with, and absolutely practical. To get direction of trouble you use headphones, which transmit a ringing when detector coil is on the wire carrying current to trouble. When the direction is certain, you switch to the lamp for exact distance, as the lamp burns brighter, the closer you are to the trouble. Detector coil can easily be slipped into place even over insulated wire.

Set comes complete with all cords and clips, full length shoulder strap, leather top cover, and battery, ready for instant use.

WRITE TODAY FOR DETAILED BULLETIN

W. C. DILLON & CO., INC.
5410-X W. Harrison St. Chicago 44, Illinois

Mr. Johnston has been in the telephone business since 1906, when he was a night operator for Interstate Telephone Co., Ltd., a predecessor company. Following that he worked for various telephone companies until 1917, when he was made wire chief of Moscow Telephone Co., now part of Interstate. He was elected vice president and general manager in 1936 and had been president since 1938.

Mr. Peter, who was named general auditor of the Kentucky properties, had previously been appointed general auditor of the subsidiaries in Indiana and Michigan. He joined the system last year and before that was associated with Arthur Andersen & Co.

V V

Combines Central and Western Divisions

L. D. Densmore, Lincoln, Neb., vice president, Central Telephone Co., recently announced the combination of the central and western divisions of that company into one to be known as the western division, which will have its staff headquarters at La Crosse, Wis.

E. B. SAMP

E. B. Samp, who has been central division manager since May of 1946, has been appointed manager of the new western division. Mr. Samp has been associated with the Central Telephone Co. since 1924, and in the course of his progression from his first position as local manager at Canova, S. D., to present date, he has at one time or another managed practically all of our properties in the states included within the newly constituted western division.

Toral Duckett, who first became associated with the company in 1928, and who since May, 1946, has been man-

These Wires Stay NEW

—and DROP WIRE, too—

because they're Copperweld

TRADE MARK

More and more telephone companies—including the world's leading systems—are using Copperweld* Line Wire and Drop Wire. They have found that Copperweld Products render long, dependable and economical service under the most severe weather conditions.

The alloy steel core of Copperweld Wire provides rugged strength—permits longer and safer spans. And the thick molten-welded copper covering permanently protects this strength—prevents corrosion—and furnishes high electrical conductance.

Copperweld Wire has the rust-resisting life of solid copper. It stays new—its voice transmission and safety are permanent characteristics. Our Telephone Data Book will give you complete details. Send for your copy today.

USE COPPERWELD LINE WIRE and GRIP-FLEX[38] INSULATOR TIES

USE COPPERWELD DROP WIRE— THE STRONGEST DROP WIRE MADE

COPPERWELD STEEL COMPANY, *Glassport, Pa.*

SALES OFFICES IN PRINCIPAL CITIES

*Trade Mark

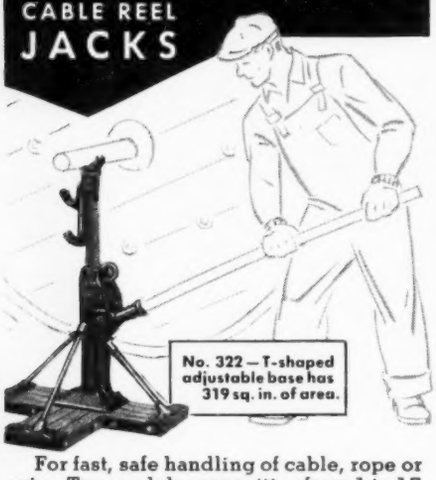
Copperweld NON-RUSTING Telephone Products

TRADE MARK

LINE WIRE • DROP WIRE • GROUND RODS AND CLAMPS • GUY AND MESSENGER STRAND
CABLE RINGS • CABLE SPINNING WIRE • NAILS AND STAPLES • GRIP-FLEX[38] INSULATOR TIES

SOLD BY LEADING DISTRIBUTORS

SAVE TIME—SPEED WORK WITH
Simplex
CABLE REEL
JACKS



For fast, safe handling of cable, rope or wire. Ten models; capacities from 1 to 15 tons. Single or double acting ratchet lowering types. Powered by famous Simplex Gold Medal Safety Award mechanisms, unexcelled for dependability and ease of operation. Also 3 screw-type models for economy. All with laminated, oil treated, oak bases for all-weather protection.

SEND FOR BULLETIN: UTILITIES 49

Simplex
LEVER · SCREW · HYDRAULIC
Jacks
TEMPLETON, KENLY & COMPANY
1046 S. Central Ave., Chicago 44, Illinois

TUG-O-WHEEL
AERIAL CABLE BLOCKS

For safe and speedy installation of all types of aerial cables. Job proven by many years of reliable service. It has been adapted as standard cable placing equipment by telephone and power industry.

BLOCK TYPE "A" For factory lashed power cable

BLOCK TYPE "B" For field lashed power cable

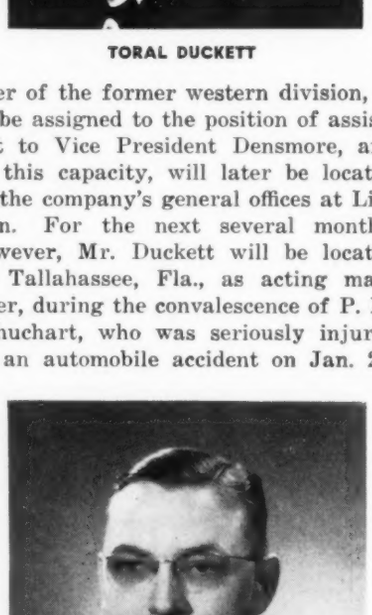
BLOCK TYPE "C" For all sizes of telephone cable

Full data and specifications covering our complete line of cable placing equipment is available to all outside Plant Construction Supervisors, write or call

TUG-O-WHEEL PRODUCTS CO.
BALLSTON SPA, N. Y.

TORAL DUCKETT

ager of the former western division, is to be assigned to the position of assistant to Vice President Densmore, and in this capacity, will later be located in the company's general offices at Lincoln. For the next several months, however, Mr. Duckett will be located at Tallahassee, Fla., as acting manager, during the convalescence of P. M. Schuchart, who was seriously injured in an automobile accident on Jan. 23.



V. B. CLARK

The former western division properties, Mr. Densmore indicated, will now be operated as the Iowa-Minnesota-South Dakota district, and V. B. Clark, who has been district manager of the company's Pekin, Ill. district for the past 11 years and associated with the Central company since 1931, has been appointed manager of this newly constituted district.

Except for these changes, the staff of the former western division now becomes the staff of the Iowa-Minnesota-South Dakota district.

for Perfect
INSTALLATION
SERVICE

Porcelain Products insulators for the telephone industry are made to guarantee top quality in insulation and top performance on your telephone installations. A complete and diversified line with each item especially engineered and produced to exacting specifications for telephone service.

Sold through your jobber. Write direct if he does not carry the P.P. line. Ask for copy of our Telephone Insulator Booklet.

PORCELAIN PRODUCTS, INC.
FINDLAY, OHIO

Looking for savings
in underground duct systems?

1. Save installation costs—Lightweight; long lengths; easy to assemble, saves time and labor.

2. Save cable installation costs—smooth bore permits easy cable pulling—reduces abrasion.

3. Save maintenance costs—Non-metallic; immune to electrolysis—prevents cable corrosion.

4. Save replacement costs—Inorganic; resist acid or alkaline soils; high mechanical strength—permanence.

5. Save fire damage costs—Fireproof because they are asbestos-cement products.

Write for Data Book DS-410, Johns-Manville, Box 290, New York 16, N.Y.

Johns-Manville
TRANSITE DUCTS
Conduit—for use without concrete envelope
Korduct—for use with concrete envelope

In the Nation's Capital

(Continued from page 24)

discovers that he or she is an actual participant in class work, in which the voices of a regular teacher and classmates are heard. Teachers agree that this experience is almost certain to improve the morale and stimulate the interest of the shut-in.

Although the federal bureau is only an observer, the movement which started in the middle west and is now spreading in the east is expected to take hold. For the telephone industry it presents a marvelous opportunity for a real and popular public service. True, the arrangement is more easily adapted to elementary grades where all the work is conducted in one room. But the value of the shut-in's sense of belonging, shared at long range by his schoolmates, may well prove to be the means of inaugurating some means of applying the principle at least to junior high schools.

Color Television by Xmas 1951?

This week, in Washington, the Radio Corp. of America claimed that it had successfully sent its color television signals through telephone company coaxial cables which form the bulk of present intercity networks. The announcement was made to the Federal Communications Commission at an official demonstration of RCA's new single-color tube, recently unveiled as a major development in simplifying and reducing the cost of color receivers.

Color transmission over existing cables removes a previous deficiency in RCA's system. Until now, sending the color signals over the cables resulted in "squeezing out" the color, so that they came out in black and white.

The color systems of Columbia Broadcasting System and Color Television, Inc., with which RCA is competing in the current race for commercial operating authority, have been demonstrated repeatedly in cable transmission without appreciable loss to quality.

Dr. E. W. Engstrom, of RCA's research staff, advised the FCC that his company accomplished the same operation for the first time just recently in a series of closely guarded tests between Washington and New York City. He said this was made possible by special apparatus which compresses the color signal sufficiently to put it through the coaxials with only slight loss in detail.

The FCC announced it will go to New York City on Apr. 26 for a dem-

THE GREATER THE PULL—
THE TIGHTER THEY GRIP

When You Use KEARNEY LAY-CIT CABLE GRIP

Lay-Cit Cable Grip is a neat compact grip that is easily and conveniently installed. Linemen can either take up or let out slack, by simply spreading the plates and adjusting the lacing.

They do not mar the insulation, and can be used over and over. Available in two sizes to handle cables from ⅜ to 1⅛ inch.

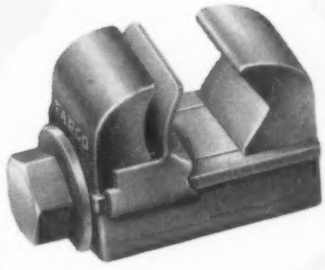
Now ready for IMMEDIATE DELIVERY. For complete information and prices see your regular jobber or write —

JAMES R. KEARNEY CORPORATION
4236 CLAYTON AVE. • ST. LOUIS 10, MO.
Overhead and Underground Utility Equipment

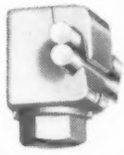
FARGO LASHING WIRE CLAMP
B-3

The B-3 clamp is hot dipped galvanized malleable iron with an electro-zinc plated bolt. Fargo's "vise-type", one-piece" design is used. A "V" groove centers messenger strands in the clamp. A shoulder on the stainless steel pressure bar controls the position of the lashing wire.

Fargo's B-3 takes any size lashing wire and any size messenger up to 16M stranding (½"). The "one-piece" construction makes it easy to install. The "vise-type" feature makes the clamp vibration proof while holding the lashing wire to its full breaking strength. The B-3 is readily salvageable.



FARGO "5000" CONNECTORS



Fargo "vise-type", "one-piece" connectors are an ideal, easy to use unit for bridging connections. Available in sizes from No. 8 to 1,000 MCM.

FARGO

Manufactured by
FARGO MFG. COMPANY, INC.
Poughkeepsie, N. Y.

onstration in the CBS laboratories of a new principle of "interlacing" the lineage on Columbia color pictures, designed to sharpen detail.

Now that both the major network organizations have come out with claims for a perfected color television process—when will it be made available to the public? A signed article by Joseph M. Guilfoyle, in the *Wall Street Journal*, quotes RCA officials as indicating that color television sets should be available for Christmas shopping in 1951.

Will they be very expensive? Here is the answer attributed to RCA Chairman David Sarnoff: "This, of necessity, must be a guess right now. But when color sets are in quantity production, they shouldn't be more than 20 to 25 per cent higher than comparable size screen black-and-white receivers." Sarnoff insists that his organization is "100 per cent for color television."

IOWA INDEPENDENT PIONEER CHAPTER HOLDS MEETING

The Tom Griffith Chapter of the Independent Telephone Pioneer Association held a luncheon meeting on Apr. 4, during the convention of the Iowa Independent Telephone Association.

Following the luncheon, Chapter President J. F. Searl introduced Mayme Workman, ITPA executive secretary, who expressed appreciation for the work of the Tom Griffith Chapter and for its cooperation with the national Pioneer association. She reported that the chapter had doubled its membership during the first year of its existence.

The principal speaker at the luncheon meeting was Dr. Oliver E. Buckley, New York City, president, Bell Telephone Laboratories. He spoke on "Recent Developments in Communications" and described such developments as nation-wide toll dialing, automatic message machine accounting, coaxial cable, etc.

Dr. Buckley stated that with the various present-day new developments and techniques will come four definite trends in future communications: (1) greater mechanization of the switching end of the business; (2) extension of areas of communications; (3) further compactness of equipment; (4) new science and new materials growing out of research. From these developments, Dr. Buckley said, the telephone industry will be able to give still better and better service at the lowest possible cost.

At a business meeting the Tom Griffith Chapter re-elected all officers and directors as follows: President, James F. Searl, Newton, vice president, Russell Shostrom, Dayton, and secretary-treasurer, Louetta Stoneburner, Creston.

Directors: C. L. Durschmidt, Ft. Dodge; Carleton Haven, Rockwell City; Mr. Searl; H. C. Shear, Waterloo; Mr. Shostrom; Norman N. Spillett, Brooklyn; Miss Stoneburner, and James L. Trevillion, Indianola.

TELEPHONE CO-OP NEWS

Discuss Telephone Co-op At Norton, Kan.

A series of meetings to see how farmers in the six-county area served by the Norton (Kan.) REA electric co-op feel about the need for telephone service are being held, according to Lorenz Wegener of Norton. He is chairman of a group of farmers in charge of arrangements for the meetings.

Meetings have been scheduled for Phillipsburg, Jennings and Norton.

At a recent meeting held in Norton, farmers from Lucerne to Long Island met with M. E. Cadwallader, Oxford, Neb., field representative for the REA, to obtain information on the possibility of forming a telephone cooperative and securing a loan from the REA to be used for repair and extension of rural telephone service.

V V

Five Small Companies In Kentucky Merge

Five small telephone companies in western Kentucky merged recently to form the state's first rural telephone cooperative association.

The group has been chartered as the H-F-C Rural Telephone Cooperative Corp. to serve the counties of Hickman, Fulton, and Carlisle. Its headquarters will be at Clinton, Ky.

The charter which Secretary of State George Glenn Hatcher approved on Apr. 6 explained the small unincorporated companies had merged into a nonstock, nonprofit co-op to improve and extend service to the largest practical number of subscribers in their territory.

The co-op will take over the lines and other equipment of the merging companies, which had a total of about 650 subscribers.

V V

Plan to Form Co-op At Farmington, Ky.

Approximately 50 persons attended a recent rural telephone meeting at Farmington, Ky., to discuss the formation of a telephone cooperative.

The organization of a rural telephone cooperative was fully explained to the group by Farland Robbins, REA attorney, and W. L. Parr, secretary-treasurer of the West Kentucky Rural Telephone Cooperative.

V V

Telephone Association Formed In Vermont, Ill.

A certificate of incorporation to the Vermont (Ill.) Farmers' Telephone Association has been issued by the Secretary of State.

The association will provide telephone service in Vermont and adjoining communities to be confined to members of the corporation.

Incorporators are Bernard Horwedel, H. C. Pace, William Sweeney and Perry Heaton, all of Vermont. The corporation office is in Vermont and is in charge of Harry F. Chick, registered agent. The board of five directors consists of the four incorporators listed above and Harry Heaton.

V V

First Texas Woman Operator Dies at Age 90

MARY ALICE PAGE, 90, generally regarded as the first woman telephone operator in Texas, died Apr. 10 at Kemah, Tex.

Miss Page, known as "Miss Mappie," was a survivor of the Galveston flood of 1900 and watched the fire that burned a mile-long corridor through that city in 1885.

She once recalled she was paid $35 a month as chief operator. That was sometime after she got her first job with the company at the age of 22, replacing two men who were operating the Galveston switchboard in 1882.

When she was on night duty she kept a big sword hanging within easy reach over her switchboard, it is said.

V V

Someone has said that some people's voices are difficult to extinguish over the telephone.

Appointed Chief Engineer of General's Operating Companies

I. B. Jackson was appointed chief engineer of General Telephone System's operating companies in Indiana, Michigan, and Kentucky on Mar. 27, 1950. He succeeds H. E. Hussey, who on Mar. 22, 1950 was elected president of Indiana Associated Telephone Corp.

I. B. JACKSON

Prior to his appointment as chief engineer, Mr. Jackson was general plant engineer for the same companies where he had charge of all outside plant engineering, special equipment applications, and transmission.

He is a native of Logansport, Indiana. After receiving his electrical engineering degree from Purdue university in 1925, Mr. Jackson joined the engineering department of Indiana Bell Telephone Co. and worked in Indianapolis, South Bend, Marion, Kokomo, and Evansville until 1928 when he became a consulting engineer and contractor.

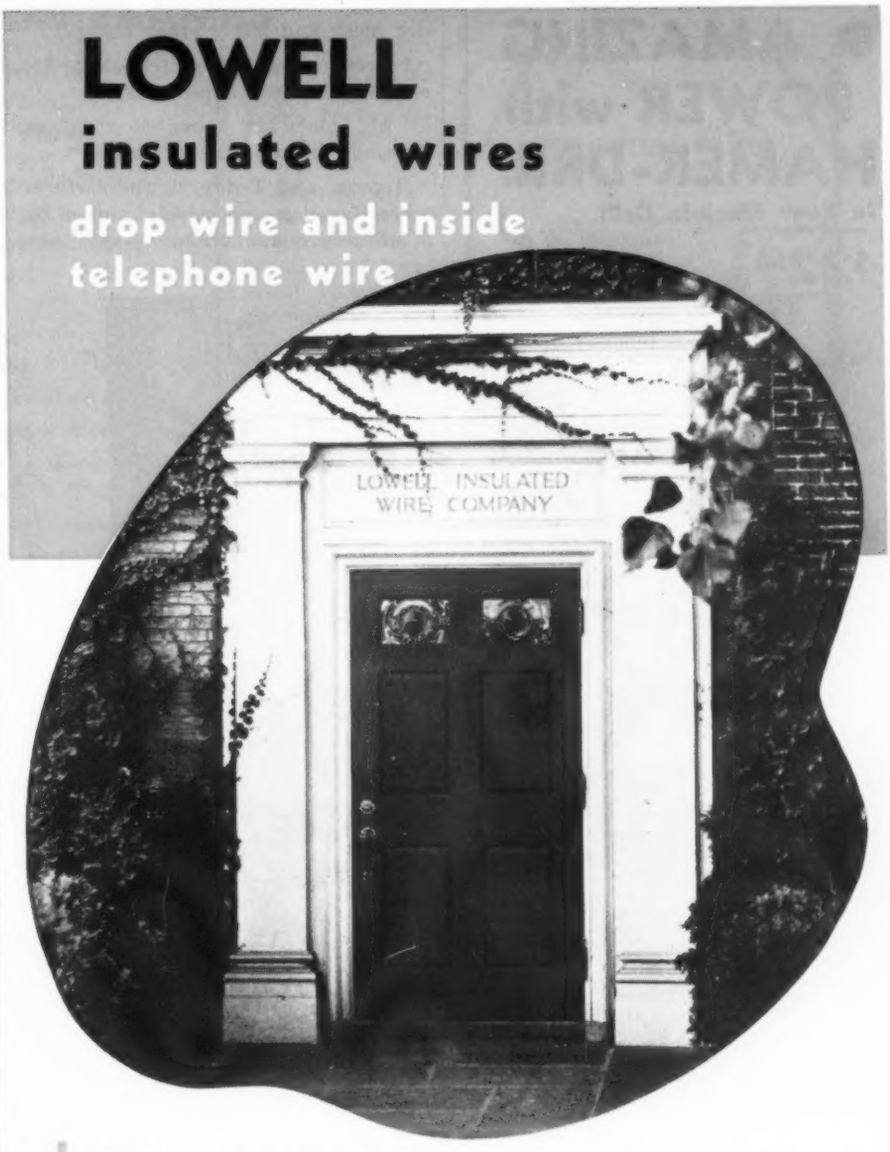
From 1930 to 1945, when he joined his present associates, Mr. Jackson was employed in the plant and chief engineering departments of the Wisconsin Telephone Co. at Milwaukee, Wis.

V V

Two Young Texans Have Head Start as Telephone Men

Tourists in the vicinity of Bogata, Tex., need not be alarmed at the sight of "midget" linemen working on telephone poles—they are probably Tommy and Teddy Smelser, sons of Guy Smelser, manager and owner of the Bogata Telephone Exchange.

Tommy, 11, and Teddy, 8, often don their work clothes and climbers whenever their father needs help in repairing his lines. They can assemble tele-



LOWELL TELEPHONE WIRE specifications will assure excellent performance and long endurance, but wire will be manufactured to your specifications wherever desired.

Insulations of rubber or plastic.

Outer Covering—neoprene, rubber or plastic jackets or weatherproof braid.

Conductors of copper, bronze or copperweld.

A complete line of Insulated Telephone Wire—outside or inside.

LOWELL

write for samples, prices, and Lowell's guarantee.

INSULATED WIRE DIVISION
of THE OVERLAKES CORPORATION FOUNDED 1903

WIRES TELEPHONE 3-1729 - 3-1720

LOWELL, MASSACHUSETTS, U.S.A.
TELEPHONE WIRES

● AMAZING POWER with HAMER-DRIL*

In Your Electric Drill

$22.50

PAT. PEND. Sales Tax in N.Y.C. No C.O.D.

To Do Your Hammering

A finely engineered tool for 1/4" chucks. Takes ten sizes rawldrills, 5/32" to 7/8". Chisels and Tool Blanks to fit.

Needed in all Trades. Gives undreamed power to your electric drill and flexible shaft. Has its own built in shock absorber.

DRILLS IN: BRICK • STONE • CONCRETE WALLS • FLOORS • CEILINGS
IT: PEENS • CHIPS • RIVETS • CAULKS • SCALES • CHISELS • HAMMERS • VIBRATES

Thru Your Local Dealer, or HAMER-DRIL CO. *Trade Mark
Box 158, Planetarium Sta.
N. Y. 24, N. Y.

THE 1601 CORD REPAIR TOOL

A handy way to SAVE TIME and MONEY

The 1601 switchboard cord repair tool provides a compact tool for use in repairing switchboard cords of all makes and types. This tool is primarily designed for use at the Central Office switchboard or Private Branch Exchange, and for PBX repairmen where it is desirable to repair the cord at the switchboard.

"HUNDREDS NOW IN USE."

For more information

about this NEW and IMPROVED method for repairing or rebutting switchboard cords.

Write...

S. A. HARRISON
• Marketing •
99 So. Downing St., Denver 9, Colo.

phones, string wire, test for trouble, dig holes and many other things.

"I can run the switchboard, too," chimed Teddy to a reporter.

"Ah, don't say I can do that" said Tommy. "That's just for sissies."

Tommy and Teddy, in the sixth and second grades respectively, have a pair of miniature climbers and a small-sized

Tommy Smelser, 11, is up a telephone pole while Teddy, 8, stands on the ground to help send up a tool bucket.

safety belt. However, there is only one set which makes them have to wear the equipment alternately.

"Don't call us 'grunts,' " they pleaded. "We're linemen."

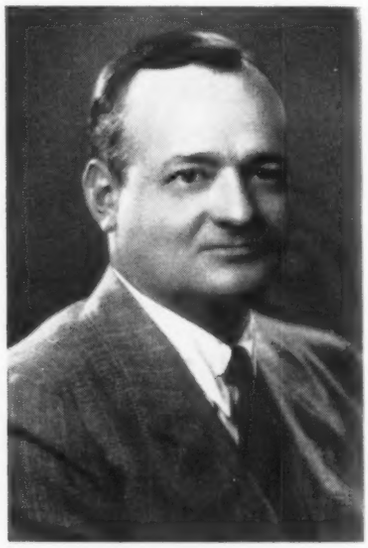
"I can't work them together," said Mr. Smelser, who has owned the Bogata exchange since 1932. "They both want to do the same thing."

Mrs. Smelser, formerly with the Southwestern Bell Telephone Co.'s Paris, Tex., exchange, isn't quite sure that she approves of the two boys climbing the high poles, although she hasn't really objected yet.

"The other day I saw Tommy high in the air, with one leg over a crossarm, soldering with a small torch," she recalled. "I told him to come down, but he said, 'Aw shucks, I've done this lots of times,' and went right on soldering."

R. E. Williams Joins Staff Of Automatic Electric

Robert E. Williams, for the past several years identified in various executive and administrative capacities with the Telephone Operating Division of the Gary Group, has been appointed staff representative for Automatic Electric Co., Chicago, effective Apr. 10.



R. E. WILLIAMS

In his new position, as a member of the staff of H. F. Lello, vice president and general manager, Mr. Williams will act in an advisory capacity to the company's customers in the Independent field on matters relating to financing, accounting, rates, and other matters in which his broad telephone experience may prove beneficial.

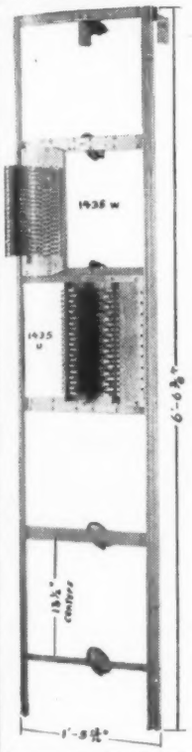
Mr. Williams' connection with the Gary Group dates from 1927 when he joined the Theodore Gary & Co. organization in Kansas City. In this position he handled various fiscal and corporate assignments following the formation of Associated Telephone & Telegraph Co. and Telephone Bond & Share Co.—the two principal parent units of the Gary Group.

During the following several years, Mr. Williams held a number of positions in both the parent and affiliated companies of the Gary Group, acting in both fiscal and corporate matters in Kansas City and Chicago. In 1939, he went to Fort Wayne as a member of the staff of Telephone Services, Inc., then the operating service center for the domestic operating telephone companies of the Gary Group.

Since 1945, Mr. Williams has made his headquarters in Chicago, where he assumed broadened duties in connection with the operation of Gary Group operating telephone companies in the United States and abroad, and in 1947

MAIN FRAMES

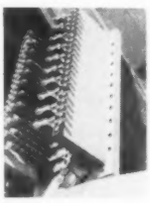
Western Electric



Western Electric 1420 B

Western Electric 1420 B Main Distributing Frame

Mounts 10 1435 W or U 20 pr. protector groups lightweight welded angle-iron construction moistureproof wrapped, factory crated. NEW FR 38 —frame only.....$15.00

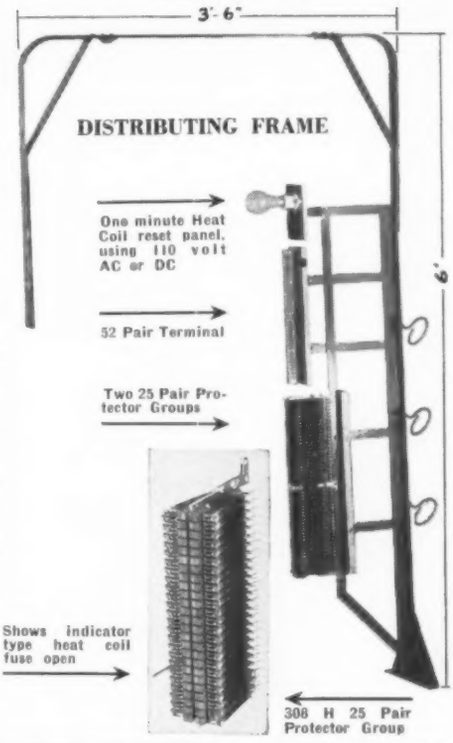


Western Electric 1435 U

Western Electric 1435 U Protector Group—Fuse protection for 20 outside lines. Equipped with 40 W.E. 7-A fuses (7 amp.). Mounted on maple fanning strip base equipped with screw terminals. NEW original factory carton. Size: 8"x 14¼"x6½" deep $5.00

Sorry, no 1435 W protectors in stock

Reliable Electric


3'-6"
DISTRIBUTING FRAME
One minute Heat Coil reset panel, using 110 volt AC or DC
52 Pair Terminal
Two 25 Pair Protector Groups
6'
Shows indicator type heat coil fuse open
308 H 25 Pair Protector Group

with complete 3-way Protection —50 pr. **$39.50**

Complete with Protector Groups, Terminals, Etc.

Frame is of light weight bolted construction which can easily be adapted to your available space. Consists of frame, distributing rings, 2 26 pair terminals (numbered 1-52) 2 25 pair No. 308-H Protector groups equipped with No. 115-H combination heat coil fuses (indicator type) and carbon discharge blocks with spares and fuse re-set panel. Shipping weight 77 lbs. New—in original factory box FR39 $39.50

TERMINALS

COOK 51 pr. uniflex TERMINAL

Used inside or out wherever an unprotected terminal is indicated. Mounts either end up in pole or wall box, underground vault, main frame, etc.
Saves space as half of the studs are on each of the two sloping front panels.
SIZE, with bracket attached, 9" wide; 12½" high plus 4¼" nozzle; 7" deep.
Complete with bracket and 10' No. 22 ga. 51 pair cable stub attached.
NEW: Factory packed crates of five terminals.
TR 133 $10.00 each; less than five $12.50 each

Western Electric BD 102

Unprotected weatherproof pole mounting. For cross-connecting two 51 pr. cables or terminating 102 pr. cable. Complete with 102 pr. stub & galvanized cover. NEW Original factory crate.
TR 137 .....$75.00

Western Electric B 101

Protected 102 pr. in wooden pole house, stub attached, Complete with fuses. NEW original factory crate.
TR 137A $99.50

T SOLDER PYRAMID TYPE

Hard rubber insulation on maple fanning strip. Six rows high. NEW.

Cook Uniflex, 51 pair

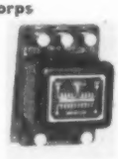
TR 134	6x30 lugs long	$3.50
TR 134A	6x50 lugs long	$4.50
TR 134B	6x70 lugs long	$6.00

REPEATING COILS

Western Electric 94 E

Talk-thru only. 4 section 17 ohm each.
NEW CL 26 .....$1.00
10 on strip to fit 19" rack CL 26A $10.00

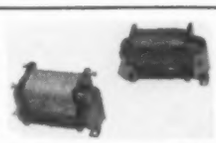
C 161 Signal Corps



Ring-thru-talk-thru 2 section 52 ohms each one center-tapped. Ideal for Phantom or Simplex. Army used them outdoors and in.
NEW CL 29 .....$1.00
Lots of Ten $8.00

INDUCTION COIL

C 105 Booster type as used in EE8 Field phone 1⅛"x2⅜"x1½" high as shown.
NEW, boxed CL 32 $ .25
per hundred $20.00



C 105

46 B Western Electric Induction coil. CL 32A .....$ .75

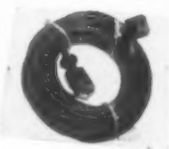
RETARD COIL

C 158 compact, as used in EE8 field phone. 1"x 2⅜"x1½" high as shown.
NEW, boxed CL 31 $ .20
C 158 per hundred $10.00

4 B Stromberg-Carlson Line coil. CL 30 .....$ .20

5 pair NEOPRENE CABLE

No. 19 ga. solid copper, color coded heavy neoprene jacket overall O.D. ½". Equipped with molded hemorphodite connectors each end for rapid coupling to either end of a similar cable. Every truck should have several to provide emergency service around damaged pole, etc. NEW factory wrapped coils of 100 & 200 ft. inside stored A-1. Fine for multiple drops to same building.
CAS 4 per hundred feet $4.00



Test set EE8 Army Field

Leather case with strap containing combination LB & CB telephone complete with hand generator, ringer, handset, induction & retard coil, etc. Operates on two self-contained flashlight cells. Reconditioned — guaranteed
TP 125 C $7.50
Rebuilt Like-New
TP R $10.00
Brand New—Web Case TP 125 N....$17.50

C-114

C 114 Loading Coil, Signal Corps Louder—clearer talking on long lines of W-110 army field wire when spaced at one mile intervals. Bakelite or cast aluminum case, rubber gasketed to prevent moisture entering wire slots. Hole-thru thumb screw terminals for rapid connection to steel & copper stranded wire.
CL 240 X .....$ .50
10 for $4.00

INS 74

INS-74
Brown Glazed Ceramic
80 or 100 per box
2 groove, screw type 2-5/16" high x 1½" diam. 3" screw-flattened shank for wrench turning.
INS-74 .....5c
Weight 70 lbs. per C.

Pony No. 9 Brown ceramic, glazed. Standard package, 100 per box. Moistureproof, partitioned case.
INS-70 .....1½c
Weight 70 lbs. per C.

ABSOLUTE SATISFACTION GUARANTEED. SHIPPED ON OPEN ACCOUNT SUBJECT TO YOUR APPROVAL. ALL PRICES F.O.B. LOS ANGELES. QUANTITIES LIMITED TO STOCK ON HAND.

THE Telectric CO.

7904 SANTA MONICA BOULEVARD, LOS ANGELES 46, CALIF., Telephone: HI Ilside 0211
GUARANTEED, SURPLUS TELEPHONE SUPPLIES

he became chief executive of the Telephone Operating Division, with executive supervision over the operations of both the domestic operating companies, and the affiliates division comprising a number of operating properties abroad.

In the fall of last year he was transferred to the staff of Maj. Gen. James A. Code, Jr., chief executive of the Gary Group, continuing in that assignment until his recent appointment as staff representative for Automatic Electric.

V V

Someone has said that courage is just fear holding on a little bit longer.

• • •

Kellogg Stockholders, Directors Hold Annual Meetings

The annual meeting of the stockholders of Kellogg Switchboard & Supply Co. was held on Mar. 28, at the offices of the company, 6650 South Cicero Ave., Chicago.

President James H. Kellogg reported that the company's operations in 1949 resulted in net earnings after taxes amounting to $589,108.08 or $2.05 per share of common stock, after allowing for dividends on the 5 per cent cumulative preferred stock.

The company's balance sheet at the end of 1949 showed a further improvement in the financial situation, the ratio of current assets to current liabilities being 5.3 to 1 as compared with a ratio of 4.6 to 1 at the end of the previous year. Notes payable under the loan agreement were reduced by $250,000 during the year.

High man on a telephone pole is Robert Kuhn (right), trouble shooter for the Okaw Commercial Telephone Co., Okawville, Ill., whose quick thinking and action during a fire that destroyed the Maxwell Bros. Elevator at Venedy Station, Ill., on Mar. 16, is another example of unusual service rendered by telephone company employes. The elevator caught fire as the result of an oil stove explosion in the office during the noon hour when the building was closed. With no telephones around, the nearest town being five miles away, Kuhn made an emergency "on the pole" call to acquaint the elevator owner, who lived 20 miles away, of the fire. He also called the local Louisville & Nashville Railroad agent to warn him that the burning elevator would undoubtedly block the tracks as it fell, endangering oncoming trains.

During 1949, dividends of $5.00 per share on the 5 per cent cumulative preferred stock and $1.10 per share on the common stock were paid.

At the board of directors meeting recently a dividend of $.15 per share on the company's common stock was declared as well as a dividend of $1.25 on the 5 per cent cumulative preferred stock. Both of these dividends are payable Apr. 29 to holders of record Apr. 4.

The shareholders re-elected three directors for a term of three years: S. Ashley Guthrie, W. C. Henry and Claude D. Manning.

As now constituted the board of directors of the company is as follows:

Loren M. Berry, owner and general manager, L. M. Berry & Co., Dayton, Ohio.

S. Ashley Guthrie, partner, Tenney, Sherman, Rogers & Guthrie, attorneys, Chicago.

William C. Henry, president and general manager, Northern Ohio Telephone Co., Bellevue, Ohio.

John P. Hooker, partner, Hooker & Randell, realtors and mortgage bankers, Chicago.

James G. Kellogg, chairman of the board, vice president and assistant secretary.

James H. Kellogg, president.

Claude D. Manning, vice president and secretary.

Harry C. McCluskey, executive vice president and treasurer.

HERE'S THE DATING COLOR CODE CHART
1947 WHITE
1948 YELLOW
1949 RED
1950 GREEN
1951 BLUE
1952 GREY
1953 ORANGE
1954 WHITE AND YELLOW
1955 WHITE AND RED
1956 WHITE AND GREEN
1953 1954 1955 1956 1947 1948 1949
DATED ALPHADUCT DROP WIRE
method of DATING DROP WIRE furnishes a FOOL-PROOF method of checking service life . . . originated by ALPHADUCT in 1947.
Blue and orange threads always identifies ALPHA-DUCT as the MANUFACTURER.
RED THREAD
INDICATES wire delivered in 1949.
This color code is changed each year.

Ray Blain, TELEPHONY's technical editor, wrote in his Plant Man's note book, TELEPHONY May 21 issue: "The maintenance of accurate service records of individual drop wire installations in the average exchange proves a most difficult task.

This difficulty has been largely overcome by the design of DATED DROP WIRE that is now being sold by at least one manufacturer.

In our opinion, this arrangement represents real progress in the simplification of accurate plant records."

You can eliminate forever costly record keeping. This revolutionary method of DATING DROP WIRE is a daring challenge to all quality claims and is your assurance of the manufacturer's confidence and willingness to have you check his product against all competition.

ALPHADUCT WIRE & CABLE CO.

Milltown, New Jersey — Over 50 years of quality manufacturing experience.

At the board of directors' meeting held at the conclusion of the shareholders meeting, the following officers were elected.

James G. Kellogg, chairman of the board; James H. Kellogg, president; Harry C. McCluskey, executive vice president and treasurer; Claude D. Manning, vice president and secretary; James G. Kellogg, vice president and assistant secretary, and Harvey O. Edson, assistant secretary and assistant treasurer.

V V

Miller, Janis Named to New Posts by Gould Corp.

Gould Storage Battery Corp., Trenton, N. J., has announced the appointment of F. A. Miller as northeast regional manager and the advancement of Mal Janis to the post of New York district manager, the position formerly held by Mr. Miller.

Mr. Miller has a 22-year background of battery experience, both in production and in sales. The northeast region consists of northern New Jersey, eastern New York and New England.

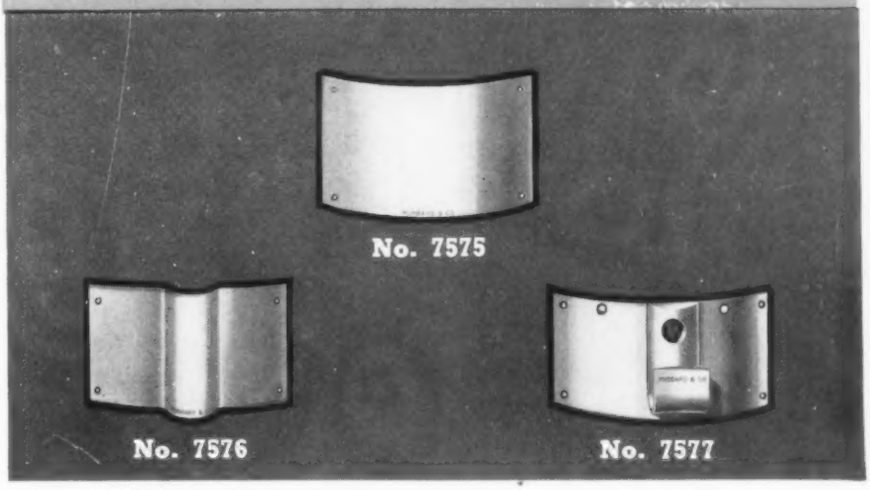
Mr. Janis became associated with the battery business through affiliation with a firm manufacturing battery equipped communications equipment. For the past seven years he has represented Gould in the New York City area.

V V

» Oddest of all telephone complaints was that of one woman who grumbled that she couldn't find out how to dial the dash before the last four numbers.

M. A. Silverman, vice president in charge of sales for the P. Wall Manufacturing Co., Grove City, Pa., has announced its new Pistogrip blow torch. This new torch design has an easy-to-grip indented handle of light-weight composition plastic.

HANG THE LOAD ON



HUBBARD STRAIN PLATES

Hubbard Strain Plates protect pole fibres from being cut by messenger or guy strand. They are furnished standard (No. 7575); with offset to fit 1¼-inch maximum diameter ground wire moulding (No. 7576); and with guy hooks (No. 7577). All styles have nail holes. No. 7577 has one 11/16-inch guy hook hole and two 7/16-inch lag screw holes. All are hot galvanized.

HUBBARD HARDWARE

HUBBARD AND COMPANY
PITTSBURGH CHICAGO
OAKLAND CALIFORNIA

CLASSIFIED SECTION

Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less.

FOR SALE

MAGNETO Telephones

300 USED, LIKE NEW, LEICH No. 533-A MAGNETO TELEPHONES EQUIPPED WITH 3-BAR GENERATOR, 2500 OHM RINGER, W/E TYPE EI HANDSET WITH FI TRANSMITTER CAPSULE.

$13.50 EACH—$12.50 IN LOTS OF 50

CHECK WITH ORDER—FOB CHICAGO

THE TELEPHONE SHOP
542 S. DEARBORN ST., CHICAGO 5, ILL.

TELEPHONE CABLE

Twisted pair color coded, rubber insulated, neoprene covered, New—stored outside. Priced F.O.B. Ogden, Utah, on non-returnable steel reels.

5-pair 10 conductor No. 19 solid copper tinned 1000 ft. at $40 per reel.

Quantity discounts on orders 25 reels or more on request.

UNITED STEEL AND RAIL COMPANY
2185 So. 21 East — Salt Lake City 6, Utah
Telephone 6-5512

NICOPRESS SLEEVE SPECIAL

Splicing Sleeves No. 3-036A or reducing sleeves No. 2-045 X036B—250 to box @.....$0.02 ea.
A. E. (unused) Battery Eliminator, 24 volts at 3 amps $65.00
"B" Drop Wire Clips—50 for.....$1.50
Lead Cable Supporters, 1⅞ dia. @.....$0.02 ea.
Sub-Cycle Converter Model B Ring, GI Serial 318 KS5523 (like new).....$29.95
Test Set EE-65E (excellent condition).....$24.95
W. E. Battery Charger A.C. 105/125, D.C. volts 17/75, A.C. amps 6/14, D.C. amps 12...$39.50
W. E. Rectox Rectifier 115 A.C. 50 or 60 cycles .280 amps to 120 volts D.C. at .125 D.C. amps (excellent condition).....$14.95
EE-8 Field Telephones (new handset handles).....$8.50 ea.

Terms: FOB Simpson
TELEPHONE ENGINEERING CO.
SIMPSON, PA.

TELE-WIRE SUPPLY CO., INC.

distributor of

- ★ **Neoprene and WP Drop, Bridle Wire**
- ★ **All types Telephone Wire**
- ★ **Plastic or Braid Inside Wire**
- ★ **Telephone Cords**
- ★ **Telephone Cable-Lead, Braid, ANKOSEAL PLASTIC CABLES Aerial, Duct, Direct Burial, Inside.**
- ★ **Cook Protective and Terminal Equipment**
- ★ **Joslyn Pole Hardware, Specialties, Supplies**
- ★ **Telephone Equipment, Supplies, Parts**

for QUALITY SERVICE PRICE

call WHitehall 3-5865

136 Maiden Lane, New York 7, N. Y.

TRIP & RESTORE RELAYS

KELLOGG No. 2083-SFU TRIP RELAY
KELLOGG No. 2064-CAB RESTORE RELAY
KELLOGG No. 2061-SFU TRIP RELAY
KELLOGG No. 2064-CU RESTORE RELAY

STROMBERG-CARLSON No. 306-AX TRIP RELAY
STROMBERG-CARLSON No. 206-ZCCX RESTORING RELAY

Above Relays Can Be Furnished with Covers & Mounting Details (Above Are All New)

BUCKEYE TELEPHONE & SUPPLY CO.
COLUMBUS 6, OHIO

QUALITY — SERVICE PRICE

Let us quote on your SPRING CONSTRUCTION REQUIREMENTS

**W-110-B, tw., pr., WP braided 4 steel 3 copper strands per conductor. UNUSED, on one mile reels . . . $9.00/mile; FOB; N.Y.

**Telex-#17-2, parallel, solid copper cond., U.S. Navy direct burial, underground wire. Can be used as Drop Wire. On one-half mile reels . . . $20.00/reel; 5 reels $19.00/reel . . . 10 or more reels . . . $18.50/reel; FOB N.Y. (The best price in the country.)

**#16-2, parallel, 7 strands med. hard drawn copper per cond., rubber ins., WP braided Drop or Distributing wire. On 3,300 ft. reels . . . $27.50/reel; FOB N.Y. (The best price you will find on this.)

All material guaranteed. Subject to prior sale.

TELE-WIRE SUPPLY CO., INC.
distributors of telephone supplies
136 Maiden Lane New York 7, N. Y.
WHitehall 3-5865